NATURE MAGAZINE

APRIL 1932 35¢ VOL. 19, NO. 4

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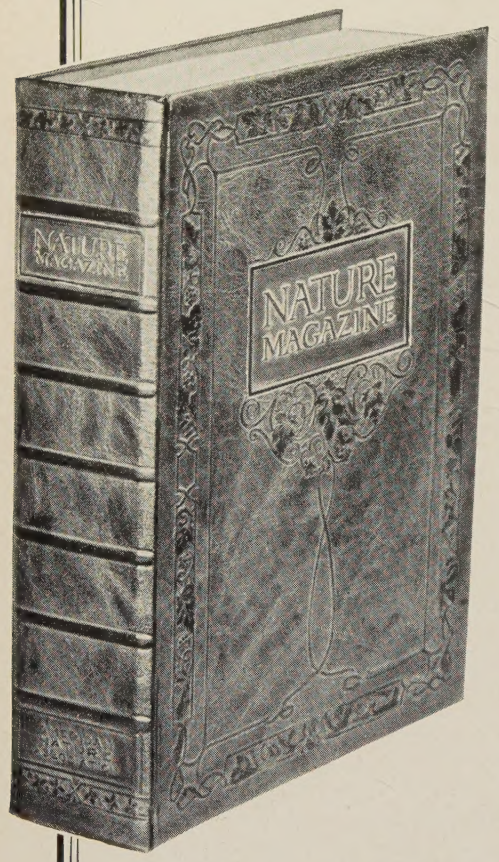

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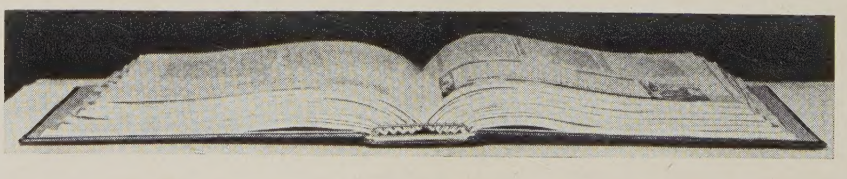

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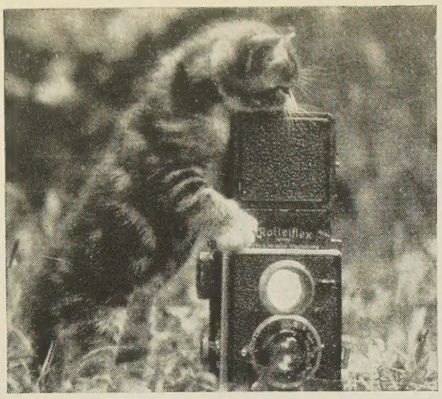

Picturing the Pets

Rover, Tabby, Pete, the canary, and the goldfish are household pets that should not be overlooked when you go camera hunting. If you live in farm country there may be, in addition, a certain horse, cow, proud old rooster, and perhaps a brand new little pig, all of which will make splendid camera "fodder."

Naturally, if you possess a movie outfit you will want your pets to be shown in motion and can easily get something to bring the desired effect.

If, however, you want to take an ordinary picture of the dog or cat indoors, you will do well to wait until they can be caught in a quiet, lazy mood. Perhaps you will come upon Rover stretched comfortably by the hearthfire, or Miss Puss curled up in that spot of sunshine on the window seat. After dinner, not likely just before, will you catch them so. At times a good picture of dog or cat at the window looking intently at something outside can be secured. A short time exposure from, say, a half to two seconds, depending on the speed of your lens, will be sufficient.

The Photoflash bulb will, of course, enable you to make any kind of indoor picture day or night. Care should be taken, however, to work quickly when opening the shutter to make the flash, then immediately to close the shutter.

Outdoor snapshots will also be easy, though probably not so interesting as those containing the home atmosphere. Again, however, it is best to catch the pet subjects unaware as animals do not generally care to have a camera pointed at them.

For the canary and goldfish, unless they be unusually sleepy creatures, it would be best to place the cage or aquarium by a window through which sunlight is streaming. Then make a snapshot. With Photoflash such pictures can be made anywhere in the house.

For close-ups, procure a portrait attachment for use over the camera lens, and, with a set focus camera, you can be 3½ feet from the subject and thereby obtain a large image.

Lighting has much to do with the securing of pleasing pictures of animals the same as in movies or snapshots of humans. Down on the farm there is much opportunity for artistic effects. Early morning or late afternoon will give oblique lightings, making a picture much more attractive than if lighted from directly in front or above.

Try some pictures of your pets and provide a special section in your album. You will find it ever interesting since, often sadly, we outlive our cherished pets.

EDITED BY ROBERT T. LOWELL

The Eyes Have It

Have you ever noticed that in the movies the actors seldom, if ever, look directly at you who are viewing the picture? The moving, speaking, "living" person on the screen becomes too distinctly a part of the audience when he has looked straight into the movie camera lens. This is not done as it is somewhat disconcerting to those viewing a picture. If, however, the actors glance occasionally toward the camera, perhaps at a point above the lens, it will be sufficient for a direct personal appeal. The audience will sense a certain feeling of "being present" at the happenings depicted, but will not be forced to feel a rather disconcerting intimacy with the actors.

It is a bit different, however, with movies you make of your friends and relatives.

It is interesting to note in certain "still" pictures that the eyes of the subject will apparently be looking at you regardless of the angle from which you observe the picture. When you view such a photograph, you will know that the subject looked directly into the camera lens when the picture was made. The eyes have a peculiar power.

Glossary of Photographic Terms—Continued

Depth of Focus—actual distance between nearest and farthest objects that are sharp in the picture.

Detail—small objects and portions of objects in a picture, such as leaves of a tree.

Diaphragm—a circular mask that covers a part of the lens, allowing light to pass through the central region only. Usually the diaphragm is adjustable, so that the opening can be of the size that light conditions require.

Emulsion—on a film, plate, or paper, the gelatin coating that contains the tiny particles that are sensitive to light.

Filter—a transparent layer of color (either a stained glass or tinted gelatin) that fits over the regular camera lens in order that rays of other colors will have time in which to affect the film more fully.

Flat—applied to a negative or print in which there is little difference in grayness between the lightest and darkest parts.

Flatness in Field—in a lens, the degree of its ability to produce a negative that is sharp at edges as well as at center.

Newsy Notes

"Tourist" is the apt name given to a new, compact, high grade camera. It is said to have all necessary features together with a fast lens. Finish: dark Russian green leather. Made in three sizes. Circular on request.

The new Pilot camera shows you the entire picture in the Reflex finder, exactly as it will appear on the film. This outfit is said to combine the simplicity of the box camera with the clear focusing visibility of the Reflex. Literature is available.

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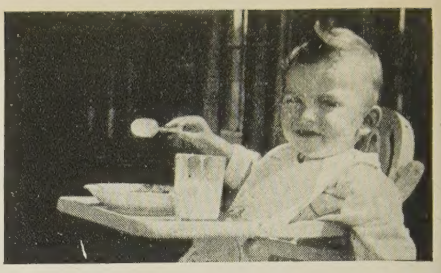
A new "gadget" synchronizes the flash of a Photoflash Lamp with the operation of the camera shutter. No longer necessary to tell subjects to hold still. The duration of the light from a Photoflash Lamp is said to be about 1/50 second. Circulars on request.



Photography's Advance

The first photographic portrait produced in this country was made just ninety-two years ago—in 1840. According to tradition, the first portrait made in this country was the first portrait made in any country, for Daguerre, the French inventor, was not thinking of portraiture when he produced his early plates. Daguerre painted scenes, and it was landscapes and housetops that first occupied his attention. Meanwhile, an American, Prof. Samuel F. B. Morse, who invented the telegraph, brought to America the formula of the new device and is credited with being the first to apply the formula to human portraiture.

To accomplish the first portraits sitters posed with heavily white-powdered faces for many minutes, some say as long as fifteen. Fortunately the sitters could wink freely. When a wink happens at the instant of a twenty-fifth of a second exposure (which, naturally, it very seldom does) it may make a great deal of difference. In a fifteen minute exposure it could be repeated without effect upon the result.

In those early days of photography, pictures of vivacious children were, of course, out of the question. Today, however, with the tremendous increase in speed of negative-making materials, and the adapting of ultra-fast lenses to small folding cameras, even the amateur photographer finds things quite different. Now, *anyone* armed with a camera of present-day design, loaded with the new films, can make pictures in a fraction of a second even in the shade on rainy days; and, as a crowning triumph, can catch a youngster at play *indoors* in bright light.

It is interesting in figuring the difference in exposures required for that first picture made *outdoors in bright sunlight,* and the one of the child shown in the illustration above, made *indoors,* to find that the latter was secured with an exposure about 1/900 as long as the picture made in 1840. Pictures are now made in split seconds.

(To be continued)

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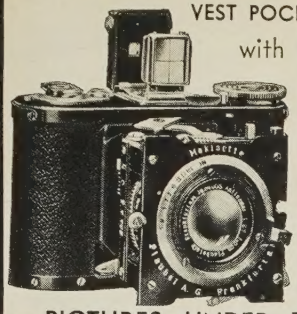

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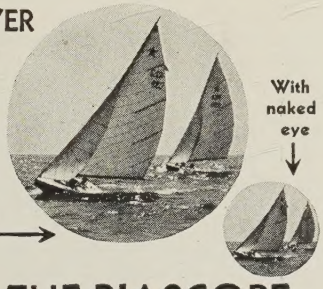

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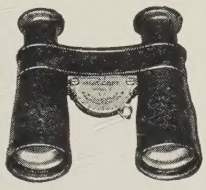

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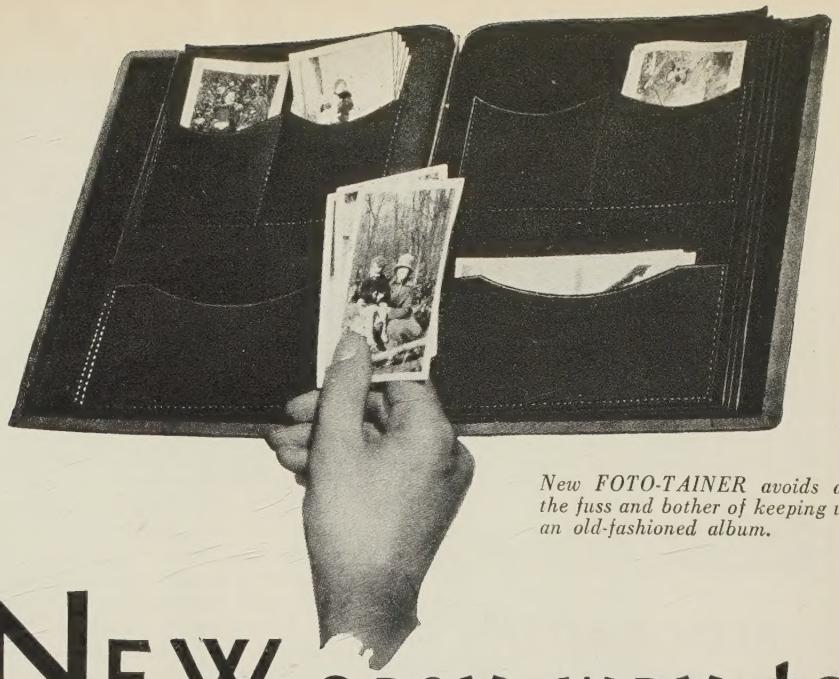

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People like to look over pictures if they don't have to hold and "wade through" a thick, heavy album. FOTO-TAINER enables you to keep pictures on each subject in separate packets, and hand each person just the prints he wants to see—your last vacation trip, the latest snaps of the baby, etc., etc. Several guests can thus look over your camera work at the same time. FOTO-TAINER gives *every*body the maximum pleasure from pictures!

No More Messy Pasting!

Don't waste any more time and patience pasting up page after page of prints in a bulky, unhandy album—fussing with tabs—constantly having to fix pictures that come loose—and laboriously lettering titles with white ink or pencil. With FOTO-TAINER you can note titles quickly on the backs of the pictures, classify them in separate packets, and you're done. Besides, you can "weed out" those no longer interesting and **re-arrange your whole collection in a few minutes!** Also, the two larger sizes of FOTO-TAINER allow you to put in additional leaves as your stock of prints grows.

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Rhododendrons and Azaleas

By Dr. Herman B. Baruch

When, during late March and April, the blossoms of the flame azalea and the rhododendron make a bower of southern hillsides, and cause the mountains to flame, the South is a garden of unsurpassed beauty and fragrance. These flowers seem to take possession of the land, overwhelming the new, fresh green of the springtime and hiding the brown of the passing winter. They are the symbol of the returning warmth, the symphony of color accompanying the march of spring.

Admirers of these two plants have not been content to make pilgrimages to see them in their glory; instead, they have prevailed upon the plants to come and live with them in their gardens. Now many a Massachusetts driveway is bordered with rhododendron, and the bright-colored azalea adorns many a garden in which, had not the hybridizer been hard at work these last few years, it formerly would have died.

There are three principal varieties of native rhododendron, and many more which have been produced in nurseries and perfected to stand transplanting. Of the natives, *R. carolinianum* and *R. catawbiense* have a much more compact growth than *R. maximum* and have the additional advantage of flowering a little earlier in the spring, before the new foliage appears. The new growth of *R. maximum* hides somewhat the flowers.

The nurseryman, while attempting to make these native types of rhododendron more hardy and at the same time preserving the beauty of the foliage, has produced a kaleidoscopic range of colors that run through the spectrum from pure white to a brilliant amaranth-red. There are, for example, the reds of Dr. Dreselhuys, Kettledrum, Ignatius Sargent, and H. W. Sargent, the pinks of Amphion and Mrs. C. S. Sargent, the purple of Catawbiense grandiflorum, and the lily whites of Album elegans and Album grandiflorum. Once it was true that the colors of the native plants did not harmonize with the color scheme of the garden; now almost any color plan permits the use of one or more of the hybrids.

In addition to its beauty of foliage and flower—which is not to be surpassed by any other plant—the rhododendron is most interesting to watch. It is almost barometric in its indication of the state of the weather. When you look out of the window on a winter morning and see the leaves drooping and curved inward on themselves, you may be sure that the day is cold and raw. When the sun warms up the atmosphere, the leaves uncurl and straighten, and if frost should again set in, they once again assume their protective position.

Both rhododendron and azalea are surface feeders, that is, they find their principal food at the surface of the ground. Consequently they require a cool, moist surface soil, which may be achieved best by the application of a mulch of either peat moss, well-ground corn stalks or oak leaves. They likewise demand an acid soil, and show their disapproval of alkaline conditions by dying. A few pounds of aluminium sulphate or tannic acid will give them their heart's desire. Any agricultural station will make a test of your soil, or, if you are further along the path of husbandry, you

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Only donkey traffic is possible in Clovelly but you will agree with Dickens as to its quaint beauty.

The mighty bells of Exeter Cathedral have been rung in the same order for nigh on four hundred years. Elizabeth and Kings and Queens before her heard their chimes. At Athelney in Somerset King Alfred took refuge from the Danes in 878 and received a citizen's rebuke for burning the cakes. Wild and beautiful Exmoor recalls the love story of Lorna Doone. Cheddar is famous for its natural Gorge and noble cheeses.

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will be able to apply the litmus or another test yourself.

The bed in which rhododendrons are to be planted should be dug to a depth of at least two and one half feet, to create a reservoir for moisture. The addition of leaf mold and a small amount of sand and peat moss is usually worth while, for if a dry period follows the planting, it facilitates capillary action to bring the life-giving liquid to the surface. It has been assumed in the past that rhododendrons had to be planted in the shade, especially under trees. While they will thrive under such conditions, they develop equally well when exposed to full sunlight. The individual plants should be placed close enough together to offer shade and protection one to the other as they develop.

With the creation of such hybrids of the native azalea as *Azalea kurume* and *A. kaempferi,* it became possible for azalea gardens similar to the beautiful displays at Charleston, South Carolina, to be planted north of the Mason and Dixon line. No one who has not tried them can realize the brilliance they add to the home surroundings.

When planted in groups, they should be set close together so they will shade themselves on hot summer days. And they are especially effective when arrayed in the foreground of conifers, where they will show their flowers to perfection.

The color range of azaleas is as great as that of the rhododendron. Of the deciduous varieties, *A. viscosa* is white or rose-colored, *nudiflora* is pink, *vasevi* a rosy-white, *rosea* a deep rose, and the beautiful *calendulacea* is a handsome orange scarlet. All these species are native to many of the northern states, and can be found growing near rhododendrons and mountain laurel on the hillsides. Of the evergreen and semi-evergreen types, *hinodegiri* has carmine flowers, *amoena* is a rosy purple, the blossoms of *kaempferi* are a brick red, *ledifolia alba* is white, the Cherry Blossom is a dainty light pink, and carmine are the blooms of Christmas Cheer. Here is no lack of shades for the creation of a color picture to challenge attention, dazzle the eye and stir the imagination!

In this day when native shrubs and plants are so much used in the home surroundings, the plants that send thousands of people southward in the springtime to view their riots of colors on the mountains present possibilities that are far from being exhausted.

Iowa Speaks

The Federated Garden Clubs of Iowa have recently issued their elaborate *Garden Book* covering events of 1931, and deserve congratulations for their wide range of interest and activity as revealed by the volume. The clubs take a strong position against outdoor advertising, and are firmly supporting the Crane survey of the state's natural resources which is to eventuate in a long-term program for the acquisition by the state of its principal beauty spots. Garden Club members in other states will find more than a little of interest to them in this year book. The officers of the club are: President, Mrs. F. C. Sigler, 703 W. Ashland Avenue, Indianola; vice-presidents, Mrs. Forest Huttenlocher and L. H. Minkel; secretary, J. C. Cunningham, and treasurer, Fred M. Steele.

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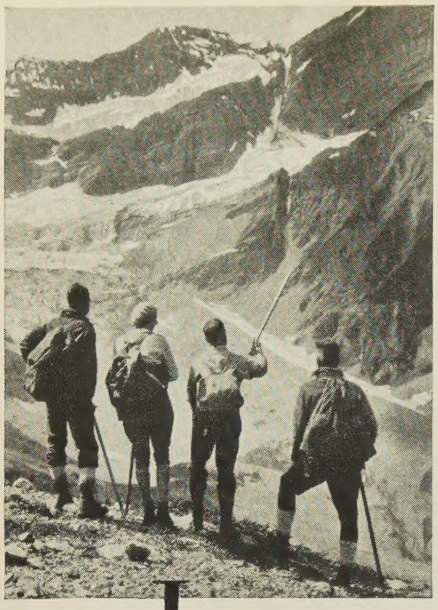

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A Thrilling Attack

The surprising fact that duck hawks hunt their prey in downtown New York City and subsist at least in part on domesticated pigeons is revealed in a recent communication to the New York *Sun* from Robert S. Lemmon, managing editor of *House and Garden*. "Several times a year," he writes, "from my office on an upper floor of the Graybar building, I see them cruising over the midtown section of the city. Generally alone, but sometimes two together, they prowl close to the rooftops, hoping to surprise unwary pigeons. The upper cornices and tower of the New York Central Building, spanning Park Avenue, are a favorite hunting ground." Mr. Lemmon witnessed only one capture of a pigeon by a hawk, and that was from a flat rock at the edge of the cliffs opposite Spuyten Duyvil on the Palisades: "A snow white pigeon came streaking out of the West just above the tree-tops, flying as if all the devils of death were hard after him. A hundred yards or so behind that white form, and slightly above it, my eye caught the dark projectile shape of a duck hawk in full pursuit. The pigeon swerved desperately, his pursuer meeting turn with turn as irrevocably as if the two birds were joined with wires." Finally the hawk reached his chosen spot of vantage, and struck. "If a lustily swung baseball bat had collided with that pigeon the impact would scarcely have been less spectacular. At the instant it looked as though an explosion had occurred, so filled was the air with feathers. For yards the two birds, locked in a swirling struggle, tumbled toward the river far below. Then the hawk set its wings stiffly, checked the fall, and with the inert pigeon in his talons flapped heavily in toward a hidden ledge far down the face of the cliffs."

Moose Also Love Music

It appears to be proved that deer are fond of music, and evidence that their cousins, the moose, also have a taste for lyric strains comes from Yellowstone National Park. Park Ranger Edward E. Ogston recently was sitting by a radio in his station while, outside, a calf moose was lying on the ground. Ogston turned on the radio, and the calf, he writes in *Nature Notes,* "turned his head from side to side like a dog listening to his master's voice." Everything went well until the announcer came on, and the masculine voice sent the creature, hair bristling, off into the woods with a very discontented air.

Brookline Bird Club

The active Brookline Bird Club conducted 121 walks, on each of which an average of 25 birds were seen, during 1931, a report for the year reveals. Twenty-nine walks were taken in the month of May, and the largest number of birds seen on any one day—seventy-five—were listed on May 30. The Club list contained 198 birds for the year, slightly fewer than in previous years. The present membership is 460, and most of the members find time to take one or more of the jaunts every month or so. That indefatigable bird-lover, L. Raymond Talbot, still presides over the live-wire Massachusetts organization.

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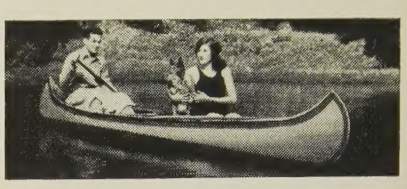

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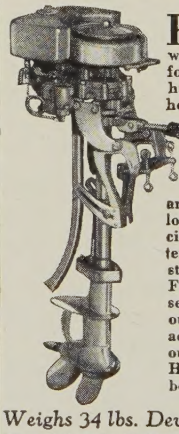

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Caching Food

The speed of a Richardson pine squirrel working to cache nuts for the winter is remarkably great, according to Dr. William G. Vinal, ranger naturalist in Glacier National Park, who last fall studied one of these creatures laying in its supply of food. "His usual procedure," says "Cap'n Bill", "is along a root to a trunk, where he makes a half-turn and a dive toward a log in a thicket. Sometimes, to fool one, he travels a circuitous route. He certainly does not store all his seeds in one basket. Once he was observed to bury ten pieces at the foot of an alpine fir, and later he stuck a bit under a cone on a Douglas fir. He also parked food in the beard moss or lichen and in a mesh of twigs which protruded from an Engelmann spruce."

Feeding Fish

A few of the tricks of successful fish raising have been revealed by Myron Gordon of the New York State College of Agriculture at Cornell University in the New York *Times* recently. For example, he says that tropical aquarium fish should be fed no more than they will eat within an hour. "The real danger in overfeeding comes from the spoilage of uneaten food. Milky water is caused by aquatic bacteria which break down the leftover food, and rob the water of its oxygen." Fishes need vitamins, he explains, which may be supplied by small amounts of lean meat, liver, yolks of hard boiled eggs, oysters and clams. They also like heat, and are best satisfied with a temperature of about 80 degrees. Mr. Gordon recommends an aquarium with metal frames, glass sides, and a slate or glass bottom to the all-glass type. It should be filled with water not from the tap, but from a well or stream, to avoid the chlorine and lime used in purifying tap water.

What's in a Name?

The Educational Department of Mount Rainier National Park is on the search for information and for relics of "The Mountain". It is equally interested in hearing from "old timers" the origin of some of the names given to topographical features of the park and in securing historical objects which depict the early days and subsequent development of Mount Rainier National Park. Old photos, early scenes, pictures of "old timers", newspaper clippings—everything is acceptable. And if you happen to know why Ada Creek, Affi Falls, Arthur Peak, Baker Point, Bee Flat, Berkeley Park, Chenuis Mountain, Knapsack Pass and Williwakas Glacier, to mention a few, are called what they are, let the Department know.

Aid to Teachers

Under the auspices of the New York Biology Teachers' Association, an exhibit of inexpensive ways and means to making science a vital experience to children is being held at the American Museum of Natural History in New York City. The exhibit closes March 26. It was conceived and arranged by Mrs. Marguerite E. Schwarzman, director of the Children's Laboratories and instructor at New York University.

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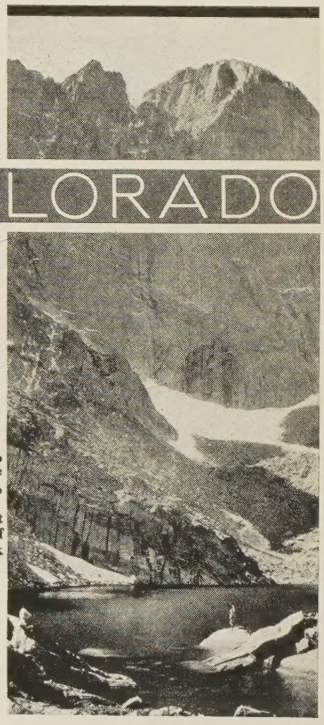

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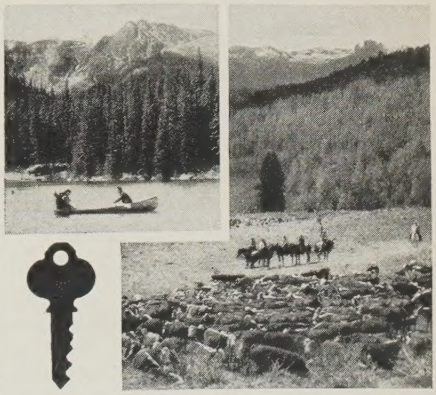

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The Fall "Round-Up" on a National Forest Range. *Above:* Echo Lake, in the Denver Mountain Parks System

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YOUNG CONSERVATIONISTS

Progressive Program Adopted in Wisconsin

SOMEHOW or another Wisconsin always seems to be in the van in initiating and carrying out progressive and constructive movements, whether economic, social or political. Once again the people of that State score with a notable program in the schools of Oneida County—this time in the field of education.

As a first item in the school program for that county we find stated the succinct goal of "every child a practical conservationist." And how have they gone about to build practical steps up to that objective? They have voted to give title to land up to one hundred and sixty acres to any school district that will put that land to work in forest production. On this land will be planted trees, and, through this planting and subsequent care, the school children will learn truly to know and to appreciate the importance of forests.

Already one third of the districts in the county have adopted the suggestion and obtained the lands. In doing so they have accepted the responsibility of governing the tract as they do other school property, and, at the same time, have made conservation and forestry a part of the school program. In selecting teachers, those with a knowledge of the fundamentals of conservation are being given special consideration.

Many of the schools have adopted conservation creeds. All of the schools three years ago joined in organizing the Junior Forest Fire Prevention League, with the result that studies and discussions along the lines of forest protection have paved the way for this latest movement involving actual forest production.

As a means to furthering the school forest program the county education leaders have enlisted the cooperation of the State Conservation Commission—itself a live and progressive body—and the State 4-H Club leaders. Arrangements have been made to obtain, this spring, young trees to be set out on the potential school forests. The State forest nursery in the county will be enlarged to supply seedlings to meet this new demand. Also the State Commission is preparing text material for use in the schools, to the end that the instruction may be given on the basis of proved material. Already slides and motion picture film along conservation lines are available for school use.

As well as the preservation and re-creation of forests, the protection of wild life plays an important part in this conservation program. It is a part of the creeds adopted. The school children are pledged to protect their wild friends and are being early instilled with an appreciation of the importance of the strict observance of the fish and game laws.

There are, of course, other details in the entire program of conservation education. We have only suggested them here. But the significant fact is that educators and conservationists in Wisconsin have realized the tremendous value and importance of teaching the men and women of tomorrow the necessity of protecting what is left to them of the priceless heritage of forest and wild life. We of this generation, and those who have preceded us, have drawn lavishly, often wantonly, upon this heritage. Much we cannot restore, but at least we can profit by our mistakes and equip those who are to follow us with a knowledge and a realization that most of us lacked when it was most needed.

There lies, also, in this program in Oneida County, Wisconsin, an object lesson that those concerned with conservation and those charged with the great responsibility of education would do well to heed. Wisconsin, to be sure, has much waste land that has been logged over and has reverted to the State or county for various reasons, including non-payment of taxes. An entirely comparable situation does not, perhaps, exist in the more populous industrial states. Nevertheless we venture to say that there is scarcely a city, town or county that does not have on its hands waste and idle land on which the taxes are in default. Most of this land is fitted for nothing but production of forest trees. What better use could be made of it than to transfer title to the school as the part of a program of school reforestation?

We would like to see those charged with conservation and education in every State call into conference their colleagues concerned with similar activities in the political sub-divisions of that State, and adapt the Wisconsin idea to their particular needs. They could do nothing else for posterity that would have greater value and bear richer fruit.

"TWO WHALES WERE BREACHING, JUMPING FAR INTO THE AIR IN THEIR PLAY AND LANDING ON THEIR BACKS WITH A TREMENDOUS SMACK"

(See Article Beginning on Page 213)

NATURE MAGAZINE
VOLUME 19 APRIL · 1932 NUMBER 4

SNAIL FOLK

BY WILLIAM BEEBE

ILLUSTRATED BY R. BRUCE HORSFALL

I CLEARED my laboratory table of the most pressing messes, and seeing no immediate squall in prospect out at sea, I started for the Nonsuch tide-pools. My artist called to me for criticism of a colored plate of snail drawings. She had just completed the delineation of one of the most beautiful things in the world, but one which, like sunshine and peacocks, has become aesthetically oxidized in our minds through over-familiarity. I suppose if rainbows were never absent from sunsets, and our woods were filled with morpho butterflies, we would begin to appreciate moths and the hundred marvellous grays of clouds.

I returned to the laboratory and compared the painting with the subject. I found nothing to criticize about the first—there was Snail, both in and out of his house, as true as life. Then I looked at the little creature itself and I forgot about the tide-pools. He was in a glass dish, and I transported both snail and myself to a place where the outside world does not dare to bother—my own private Nonsuch den, and my diminutive Shellfish and myself looked at each other eye to eye.

This is the second of two stories of sea folk written by Dr. William Beebe and resulting from the studies made by the Bermuda Oceanographic Expedition, sponsored by the New York Zoological Society. They will form two chapters in the book "Nonsuch: Land of Water" which is being published this month.

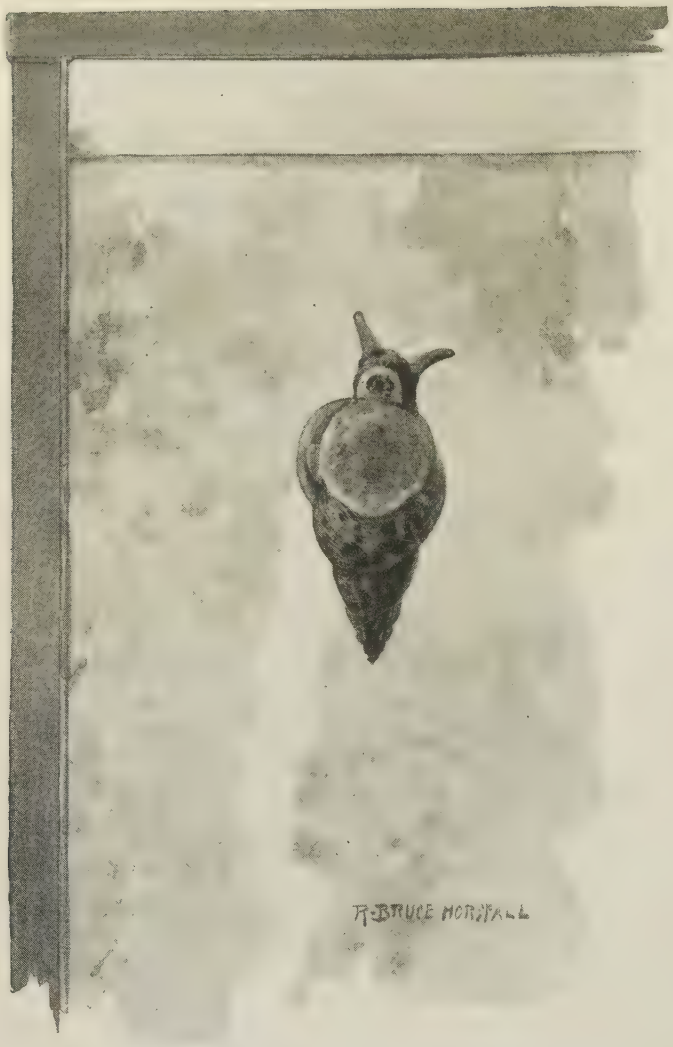
It struck me at once how perfectly silly it would be to call human beings "white-oaks," for no man is an oak and only a certain proportion are white. But it is equally illogical to indicate snails and oysters and octopuses by the term "shellfish" for none of them are fish and many have no shells. However we cannot give up "starfish" or "crayfish" and editors have an unreasonable objection to newly coined words. Mollusk is really the best general name, for all shellfish are soft. Whichever way we look at it, the English language is very often scant when we require exactness. But we need not pause for such discussion.

My snail was a periwinkle, or winkle as they called him in the days of Good King Wenceslas, and of gastronomic King Hal as well, for dozens of generations of humans have proved hundreds of generations of winkles palatable. At present he was quiet and conservative—deep within his shell with his door shut tight—thinking the periwinklish thoughts which one does when deep within one's shell. I filled his dish with salt water, and however tight his brown mahogany swirl of a door seemed to be, yet knowledge of the change in the outer element somehow trickled through. The lid lifted—a dark finger of a tentacle wavered tentatively, an eye glinted in the portico and out came the owner. His ancestors, like mine, unquestionably came from the sea, but his scientific god-fathers for once have christened him reasonably and he is *Littorina*—a shore creature.

The little snail was now gliding across my table-top—a wisp of twisted lime and a pinch of soft flesh, typifying all the strange personality of his race. He was young—not fully adult, and, like myself, representative of the last, the most recent generation.

Shortening the level of my outlook to his, little by little I began to see existence from the eye of a snail. I forgot the common bonds between our phyla—gastronomic, utilitarian, financial, even artistic, and took sheer joy in watching him, trying to pry as deep as I possibly could into his molluscan soul.

Life seemed full of purpose to him,—a life that, without interruption, extended back to the first snail. This is a truism, applicable to all other living organisms, and



"AS THE SNAIL CLIMBS THE ALGAE-COATED GLASS HE LEAVES A NARROW, CLEARED PATH"

far back in the dim early ages of earth life, there lived some creature which today, snail and I can call *our* ancestor. But the changes which have intervened in the meantime are immeasurably divergent. As my line stretches back my brain contracts, my muscles expand, I drop down on all fours, sprout a tail, develop long ears and snout, my teeth simplify, and insects satisfy my hunger; reptilian characters accrue, my ribs increase; I slip into the water, and looking for the last time upon the land, I sink beneath the surface. Gills mark my rhythm of breath, limbs shrink to fins, and even these vanish, while my backbone, last hold upon the higher life, dissolves to a notochord. At one end of my evolution Roosevelt called me friend—millions of years earlier any passing worm might have hailed me as brother.

My little snail has glided about unchanged through all the ages—through the travails of primitive ape-men, the frightened, nocturnal scurryings of tiny insect-eaters, the splashing of mud-hopping amphibians, the swimming of swift-finned, water creatures, and the wriggling of still more lowly ancestors of the sea. When a nation shuts itself off from other nations behind physical barriers or those of conceit, progress in the best sense ceases; when an individual miser or hermit or egoist lives safe and selfishly, he becomes automatically static. Finally, when a race of creatures develops an ability to clothe itself in impregnable marble palaces, immune to a host of dangers which threaten less armored brethren, there is little need of their changing to meet new conditions.

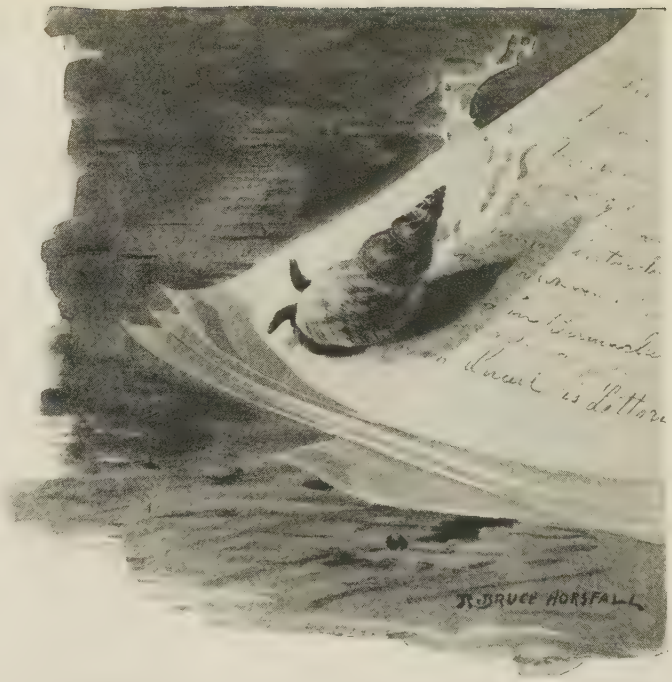
And so let us compare the past history of man and his mammalian forebears who have fought the fight naked, with the line of gentle, sheltered snails. Ten thousand years have seen the development of what we are pleased to call civilization; ten million years ago man began to be man rather than ape; fifty millions of years saw the first mammals that ever were. Five times this period, or two hundred and fifty million years before 1931, saw genera of snails living and thriving, unchanged from these alive today—at a time when no bird or mammal or flowering plant had yet appeared. In the Upper Cambrian mollusks were abundant, and a few well-developed and going snails were living in the Lower Cambrian—five hundred million years back. Now look at our snail with renewed respect; his ancestors with shell, muscles, movement and life closely similar to his, were alive when the earth itself was only three-quarters evolved.

We are reasonably certain that the higher evolution had little impetus in the deep sea; conditions there were too stable and unchanging, competition was hardly felt: Not until the hard rock and the shifting sands of the shore were encountered, the crash and drag of waves, the submersion and exposure of varying tides, enemies in pool and air—these demanded change, adaptation, extermination, and progress.

As yet we know nothing definitely about the very early ancestors of our snail, but, as we have seen, even in the early eons of the sea he had achieved a shell; and when he crawled shoreward and out upon primeval mud-flats, it was as if he dragged with him a bit of the unchanging deeps. As long as food was at hand and no danger threatened he crept slowly along, peering safely from a narrow crevice between earth and shell, and at the first hint of trouble withdrew within his mineral castle. Such a procedure made for individual safety, but cramped the style of progress. In the course of time the architecture might vary—spines and pillars, furrows and cones might be added, pigment of the whole spectrum, a hut-like home which was its own door, or an elaborate hinged entrance; a mere flattened scale or an embossed superstructure of jointed armor—to such unimportant lengths of variation, but no farther, might a mollusk go without endangering precedent. No wonder we find these creatures dominant as fossils—when in life they are little else, born in a ready-made, rocky sarcophagus, with interior decoration and reinforced concrete construction as their chief indoor sports throughout life.

With the slogan of "eternally conservative" the an-

cient snails spread along all the shores of the sea, clambering to the furthest spray of high tide. While they were content to munch old fragments of algae and cringe to all the cosmos, their neighbors fought and died, and through their changed offspring lived again. Landward crept the pioneers, fish, crabs, worms, and even lowly single-cellers, all changing, altering every portion of their beings to meet and cope with the new conditions. And along with this host quietly glided the same old snails, outstripping their other neighbors of the dawn of life—sponges, jelly-fish, and sea-urchins—which were fated forever to remain prisoners of the denser medium, and hastening in the foot-steps of their betters. Today I see cousins of the periwinkle in full sunlight, creeping upon dry leaves high over my head, far from their original home, yet with almost no external adjustments to the new life. If sheer number of species spells success, then mollusks are second only to insects, with at least sixty thousand of living forms.



"HE SMUDGES A LINE OF THE INKY WRITING AS HE PASSES OVER IT"

Having abused my little snail and heaped scorn upon his ancestors and his conservatism, it amuses me to think of some of his virtues and achievements. "Just a snail" is the sum total of the conscious thought given by most of us to these creatures. Even when we become enthusiastic over the delicacy of form and color of a collection of shells, we think of them as an assemblage of inorganic crystals rather than as the homes of living individual animals, which have sought food and a mate, have travelled perhaps many miles in their lifetime, and experienced adventures as momentous to them as shipwreck or creeping barrage are to us.

The shells of mollusks are as worthy of attention as they are beautiful. The interest of a Wall Street banker and a collector of sea-shells might reasonably be taken as representing antithetical extremes, and yet shells from the point of view of money have vitally concerned both the savage and the man of science. The latter has been willing to pay hundreds of dollars for a unique or an especially rare specimen, while for many centuries cowries and wampum have passed as the only monetary medium of exchange in many lands. To be sure four thousand cowries have sometimes had only the value of a shilling. And wampum of the right purple color once had great purchasing power in land and slaves.

While our sophisticated banker might sneer at the idea of a cabinet of shells, however beautiful or rare, and laugh at a necklace of cowries hung on some savage squaw, yet he will pay fabulous sums for the shining spheres that are the evidences of disease in four and twenty pearl oysters.

All the time we are rambling on with what we are pleased to imagine worthy lucubrations, our snail is steadily placing the inches behind him. He turns neither to right nor left, and his pace is unchanged whether over glass, cedar, blotting paper, or manuscript. At the edge of the table I revolve him and he unconsciously glides back—the points of the compass are all one to him. I start him again at the bottom of his dish and watch him carefully through the glass. When his operculum or lid is slowly lowered from place it is followed by his head—a real one with mouth, two sensitive horns or tentacles and two bright eyes at the base of the horns. The only other part of the snail that is visible is the oval, flat, fleshy foot on which he moves. There is a line down the center and the snail advances by shoving ahead first the right, then the left side, as a man shuffles along on skis or snowshoes, only the snail gains distance by successive waves or ripples. The horns look and move exactly like the trunk of an elephant, the eyes look like black dots, the head

"THE MOON SNAIL IS BUSY WITH SOME NEFARIOUS WORK"

"AT THE END OF THE FURROW WAS A GIANT CONCH, FOUR FATHOMS DOWN"

is dark brown and the body and foot are pale olive green—this is our snail as I see him.

When he reaches the freshly-written preceding paragraph, he smudges a line of the inky writing as he passes over it—as if he well knew how much better it should have been written. In fact, when I came to examine his trail I find a split infinitive quite rightly smeared with his slime. The smudge is made by a fluid that he pours out in front, thus oiling his path in advance, smoothing the boulders of dust and killing any unpleasant feel or taste of inks and other alien fluids in his way. I think I have heard of sledges in Madeira, which ease their passage over dry cobbles with dripping oil, or it is as if a sleigh were provided with a pair of ice machines in the fore runners. It is an excellent idea and brings a snail clean and fresh to the end of its journey, whereas otherwise it would be coated and choked with dust.

As the snail climbs the algae-coated glass he leaves another trail—a narrow, cleared path on the glass over which his mouth passes and scrapes clean. And I marvel again at the slimy alchemy by which he can transmute lowly vegetable scum and salt water into graceful limestone spirals.

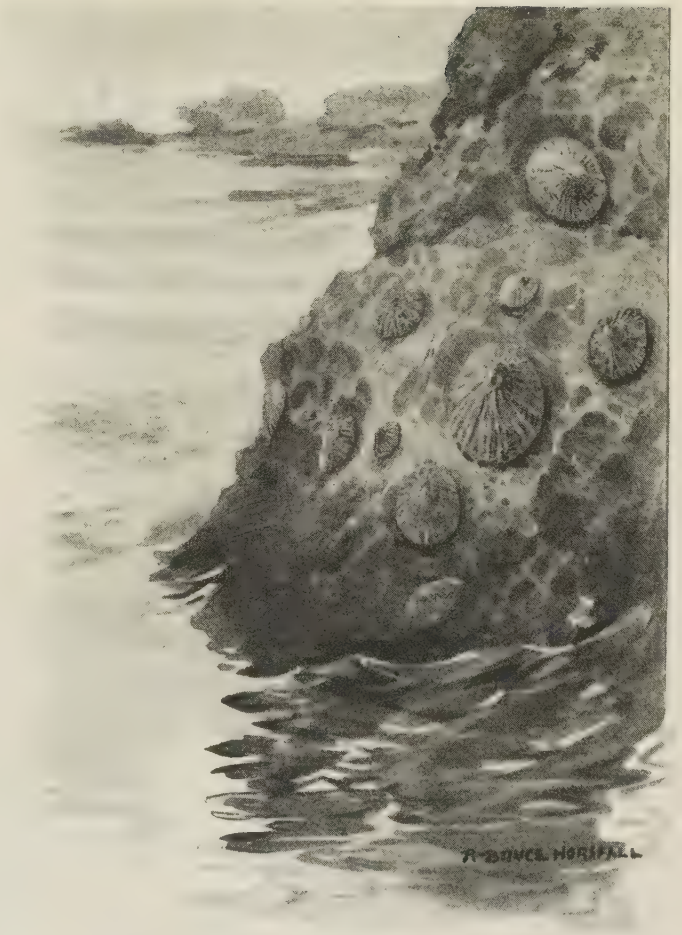
I now begin my detective work, which is all that real science consists of, and first of all hold a stop watch on my snail. I know that I am only imitating Aesop, but in the famous *Turtle-Rodent Derby* no exact time was given. I find that on the straightaway, snail can make three inches in one minute, and several heats of this one (which I have rather obviously called Frank) and of a brother snail, give the same pace. To show off my mathematical skill I may state that this speed will in the course of time and space give a foot in four minutes, a yard in twelve and a mile in fifteen days. Since I have named my snail and had his portrait painted his life is inviolate, so I sacrifice a neighbor of exactly the same size. After a painless death he is removed from his shell and I find that he weighs one and a quarter grams, his house two grams and his thin, horny operculum only seven-thousandths of a gram. We have a corresponding figure in a man weighing one hundred and twenty-five pounds, carrying a shed of two hundred pounds and a door of about a pound weight.

One of the most amazing things in the world and one of the most exquisite adjustments is the slow unconscious fashioning of the shell by constant additions to the rim as the inmate slowly increases in size. No blueprints, no architects' designs, no plans; just a formless mass of living jelly taking lime dissolved in the water as food and depositing it in smooth shell, or twists and columns and ridges; dyeing it scarlet, lavender,

green and royal purple. The color factory is along the edges of the mantle so when an accident occurs to the shell farther back, while the marble patch is laid on at once, it is always white, uncolored.

The shellfish that have ensconced themselves in their armor just where the sea pounds heaviest have a double defense which seems well-nigh impregnable. One of the most dramatic things is the way other organisms have learned to encompass the smashing power of their watery moats, and to pierce their marble forts. It is a fight against strong odds and has several fascinating twists. Two families of the snails of Nonsuch that live their lives in tide-pools or on the cliffs amid swirling currents or within crash of the breakers, are the limpets and the chitons.

If we do not mind returning for a few minutes to this damp, agitated ancestral home of ours, and squat down among the water-worn gorges and canyons, we will see here and there the little wigwam-like dwellings of the limpets. The low spreading, well-guyed tents of the Arabs are the only structures that will stand the terrific blasts of the desert storms—and in this snail world of crashing, pounding elements, block houses, turrets and towers would soon be torn to fragments. But even in this narrow dynamic zone Nature has exquisitely exact adaptations. Low down, where for ten out of the twelve hours of tidal change there is no quiet or rest, the limpets are few in number, but these daring pioneers are encased in low, very stout shell-tents, with smooth slopes on all sides. As we get higher, the shells become thinner, and well out of the watery rush of mid-tide we even find decorative furrows and ridges and a bit of color—a dash of pigment here and there. What lessons the designers of suburban bungalows could learn from the so-called lower animals!



"WE OBSERVE THAT THE LIMPETS ARE CREEPING SLOWLY OVER THE UNEVEN SURFACE"

If we watch closely we will find another equally delicate adjustment to this life among inimical elements—this time a habit. Where we are sitting, drenched with spray, but beyond the actual impact of the breakers, we observe that the limpets are creeping slowly over the uneven surface—our cracks their canyons, our irregularities their ranges of mountains. They have no definite route but feed as they go, scraping the new growth of algae from the surface.

Armed with water goggles so that we can see more clearly, and, crab-like, clinging tightly with hands and feet (and longing for a tail), we creep down into the front line trenches of this elemental battle-field. Here the waves threaten to tear away our unshelled, molluscan forms and roll us down the submerged slope of Bermuda mountain. Gasping, and with eyes concentrated for the brief intervals between the crash of the green and white water, we detect the limpets of this zone. None is moving, all are quiescent, and if we choose one or two for intensive observation we see that their resting place is perfectly adapted to the outline of their shells. With a knife we pry one loose and find it is actually sunken in a shallow pit—another guard against being swept out to sea. This implies a permanent residence of sorts and then we remember that Aristotle, two thousand years ago, knew and wrote about the daily grazing excursions of the limpets. When the pounding of the waves eases somewhat they leave their forms and hastily crawl about, swinging their tiny, many-toothed scythe, and cutting a swathe through the sea-weed fields as they go; then they return, how, we do not know: whether by retracing their glairy trail, or by the dim remembrance of crags and valleys, or by some strange memory of place, a homing quality of the little snail's ganglion.

The simplicity of the outward appearance of the limpet's tent is deceiving, for it belongs to the snails and its young show distinct coils. Associated with the limpets on the same rocks are chitons, or armadillo snails, which have eight, hard, transverse plates in a line, as unlike an ordinary snail as may be. They cling tightly, and when pried off curl up like a pill-bug, or an armadillo. In my brief résumé of my devolution I have said there was a time when my ancestors had many more ribs than I, and this repetition of similar parts is an almost certain sign of lowness of type. The chitons are the only snails with more than one shell; they have eight, and all quite untwisted, in a straight line.

Here, then, we have mussels, snails, limpets and chitons, all living close to the shore, all protected with hard shells from danger. The rocks should be covered with untold hosts of them, as safe in the battle of life as a knight in full armor would be in an encounter with half a dozen serfs.

But the law of compensation is always at work, and there can be no aces up the sleeve in the game with Nature. The stakes are Life or Death and too often the dice seem loaded in favor of Mung. Here is an unusually large, strong limpet. His vacuum grip defies the smash of waves; his constitution can withstand the occasional drenchings and submersions of fresh rain water; his gills hold sufficient store of salt water to last through prolonged heat droughts. Yet one day, without warning, there occurs whatever, in limpet language, stands for explosion, eruption, tornado, cyclone—his house is ripped from its foundation, he disappears down a great throat, and he is troubled no more by the self-sufficient smugness of too great success. And the oystercatcher, the great black and white bird, wipes her scarlet, knifelike beak on the nearest rock, and trots unconcernedly on to the next limpet or mussel or chiton. Any sympathy for the snail is leavened by thoughts of the untold generations of oystercatchers during which the shape, pattern, thinness, sharpness, verticalness of their beak blades have developed hand in hand with habit and skill. Admiration of a specialist in attack must always exceed concern for the safety of a pacifist.

"ON THE SAME ROCKS ARE CHITONS, OR ARMADILLO SNAILS"

One more action and reaction in the life of a limpet or a mussel and we will leave the world of snails. Again please visualize a limpet that has attained adult snailhood unharmed by elements or waterfowl. He is crouched in his perfect fitting form, perhaps peering out through the merest crack at his two-plane world, when he feels the touch of a tentacle on his shell. Instantly he draws tightly down and does everything that a limpet knows in the way of bolts, bars, portcullis, blinds and vizors. Still his sensitive shell transmits the shifting play of a delicate touch. Then a heavy weight presses down, and for a time nothing more happens. One of the most terrible sounds in the world is the sudden, unexpected grating of the keel of a boat upon hidden rocks, and some similar sound comes along the nerves of the limpet. Grind, grind, grind comes the new sound—we might liken it to an endless filing or scraping of sandpaper.

By virtue of our capacity as onlooker, we shift attention from the intimate emotions of our limpet to his environment. A great snail, the moon-snail, with a rounded shell and a large amount of fleshy foot has climbed upon the tent-roof and is busy with some nefarious work. We perceive a whole kit of tools—burglars', or executioners', or what you will. A narrow band covered with thousands of minute sharp teeth, like an ever-moving file, is moving swiftly upon a small section of the limpet's shell. Soon a small round well is bored through—the shell is perforated. Then a most horridly ingenious tool comes into play, a living pair of shears, on the end of a long mobile proboscis. This is pushed down upon the unfortunate limpet and actually begins to cut and hack it into small pieces. One by one these are sucked upward through the hole, and when the moon-snail packs up its outfit and moves away, it leaves a limpet shell, still ensconced in the rocky form, still a perfect shell except for the tiny round hole—but a shell without a limpet. The interior is thoroughly cleaned of every particle of the former owner.

As we watch the moon-snail glide smoothly on its way we observe that the long tentacles are never still—they forever ply here and there in the path to come. And we look for eyes and suddenly realize that the moon-snail is blind. It feels its immediate way through life by touch, but its victims must be run down—I was going to say by sense of smell, but in its watery element it is more correct to call it sense of taste.

My first memory of any snail is of long lines and curves of conch-shells along the walks and around the flower-beds belonging to my grandmother. In the days of the Great Queen that was considered the last word in landscape gardening. And it was a conch that led to my most cruel disillusionment—even worse than the passing of Santa Claus. I used secretly to grub up one of the garden conchs, hold it to my ear and in spite of the downpour of soil, listen ecstatically to the sound of distant surf in the heart of the shell. The double joy of this was totally (Continued on page 262)

PHOTOGRAPH BY ROE DYKEMAN

AN EXCEPTIONAL PICTURE OF THREE WHALES BLOWING AT ONCE

The skipper of the Westward snapped this one as the yacht neared the entrance to Glacier Bay in its quest for whales

LEAPING WHALES AND FALLING GLACIERS

BY ARTHUR NEWTON PACK

This is the third of four articles by Mr. Pack based upon the 1931 American Nature Association expedition to Alaskan waters.

"THERE she blows!" came the shout. "Over towards shore! She blows!" The skipper darted to the wheel and spun it over. We dashed for our cameras. The chase was on. Finley took up his place on the pulpit in the bow, camera in hand. Mrs. Pack, similarly equipped, mounted to the roof of the pilot house, while I manned the big camera forward, sighting over the top of the long telephoto lens with one eye and peeping through the finder with the other. "There she blows ahead!" came the shout again. "Gosh! Look at that hump come out! Now she's sounded!" Again and again the camera caught the lifting hump. Whrrrr! The spout rose less than one hundred yards away. She sounded closer still. Whiff! —a shorter one. In the center of my finder the great hump rose until it filled the whole frame. It extended beyond it, then sank, front end first, and up rose that great tail, higher, higher. It stood straight up, the giant flukes pointed skyward. Then they, too, sank in the foamy sea.

We had come to Alaska to film whales. There are whales of many kinds on many seas, but now few are left—eager and greedy commerce has so long placed a value upon the whale's head. Upon his head indeed, for, be he sperm whale with a head case full of invaluable oil, or be he a whalebone whale with jaws full of valuable baleen, the greatest value is there. Conservationists are worried about the future of the whale. They have talked about an international treaty to regulate whaling. They have puzzled over the almost insuperable problem of how to distinguish the male from the female before it is too late, for a whale is a mammal bearing one baby at a time and nursing that baby as all mammals do. Many a whaler has captured his prey only to find that he has taken the mother and brought an end to another line of reproduction.

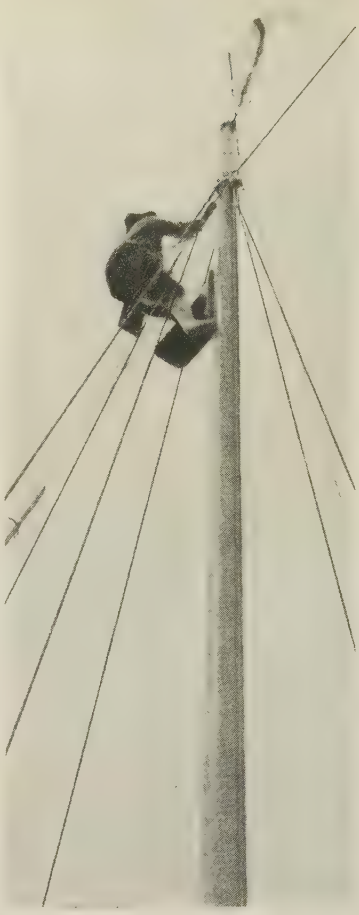
For ourselves, we hoped only to be able to perform the difficult feat of photographing the strangely athletic performances of the humpback whale which is noted over all the seas for his playful mating antics.

MR. PACK AT THE LENS

Photographing the whales from atop the pilot house

When that first cry of "There she blows!" sounded, the *Westward* was just entering Glacier Bay. One hundred yards away floated a small iceberg, its blue-green summit crowned with a row of sea gulls. In the pilot house Mrs. Pack stood at the wheel, while several other members of the party had gathered there for shelter from the cold wind. After the whale sounded, we knew it would be about five minutes before we saw him again. Slowly the skipper nosed the yacht around, for we were approaching an uncharted shore. Far ahead the clouds had lifted to show the great ice wall of a glacier. Two little icebergs—one white and one deep blue—floated to our left. Then the whale again drew every eye. "He's going in toward shore," said the skipper. "Heave the lead, Bill." The engine had ceased even its slow throb. "Fifteen fathoms, no bottom!" called Bill. Again the throbbing pulse of the screw. Three times running the whale blew, then once more sounded. I looked at my watch to note with surprise that more than an hour had already passed in the pursuit. It was six o'clock. Ahead lay Berg Bay, which was to be our night's anchorage, and there directly in the entrance the whale rolled unconcernedly. He was making for our destined port ahead of us. We slid slowly after him and headed up the bay. Now, simultaneously, swift porpoises appeared on our left and a curious seal rose ahead as if to inspect this strange newcomer in his harbor. Half a mile ahead the whale circled, passed between us and the shore and once more set out to sea. We could do no more that day.

Next morning the *Westward* swung out of Berg Bay in the silver dawn. We stood clear of the entrance and ran on for only a few minutes before sighting our whale ahead —not merely one whale, but two. But on this first really fine morning, with the clouds steadily lifting, we felt that it would be a case of now or never for the scenic run into Muir Inlet. To be sure, we followed the whales as long as they led on our course, and fortune favored the photographers with a great chance. Both spouts and a vertical sounding dive were performed less than one hundred yards away. Far across Glacier Bay we saw the spouts of two other whales.



BILL FINLEY GOES ALOFT

Up in the bos'n's chair as lookout and to photograph from this point of vantage. Below, the whale sounds, flukes vertical to the sky

Now we swung northward, opening to view the whole of the grand Fairweather Range. Gradually the last wisp of cloud lifted from the peaks, and Mount Fairweather itself rose majestically in the west, fair and free. Although only 15,300 feet in height, this mountain is the most beautiful and spectacular peak in southeastern Alaska. We were certainly in luck, for such a view as this comes rarely.

Then the *Westward* crept on into Muir Inlet at half speed, nosing a cautious way through the drift ice and between larger bergs. As smaller chunks of ice caromed off the bow, the sturdy yacht trembled with the impact. Thicker and thicker grew the drift. The skipper could see no open water ahead and ordered the engine stopped while he was hauled aloft on the foremast in a bos'n's chair to look out the channel. Yes, there was open water to the right. The *Westward* ground slowly out of her blind alley. We felt like true Arctic explorers. Slowly the great ice wall drew nearer. Muir Glacier has receded about five miles since 1910. A low bare island of glacier-planed rock has since appeared about a mile from the present face of the glacier. Here Finley and Mrs. Pack were landed with cameras to photograph the *Westward* as she worked her way between two large bergs of soft, pale blue.

Once out from behind the island, the skipper found a lead fairly free of ice and ran on to within half a mile of that stupendous wall of ice which is the face of Muir Glacier. Closer we dared not go,

for no one knew how far out from the visible ice wall the under-water shelf of ice might project. Even where we lay, it seemed as if that pinnacled barrier of dazzling white and deep blue might so easily sweep down to engulf us. Every few moments some great block of ice, probably hundreds of tons in weight, would break away and plunge heavily into the sea, followed by a cascade of smaller particles. Immediately a geyser sprang up from below and then to our ears would come a sharp crack followed by that hollow echoing boom which we had been hearing for an hour past. The *Westward* rocked on the long swells. Cameras cranked and buzzed. Then, with cumulative progression the falling blocks grew larger, each explosion setting off several more. Great cracks yawned in the mile-wide glacier's face. One small iceberg rose near the stern of the *Westward* and Bill dashed for the ropes where our dinghy hung in the davits. Just in time to keep it from being crushed, they hauled our little boat higher to safety. Jack, meanwhile, dashed down into the cabins and began closing ports to keep the ice from coming into the rooms. Then once more we turned our eyes back to the glacier. There was a shriek from all hands as one tremendous iceberg broke loose, toppled forward, sank in the boiling waves, and then rose again in awful might and majesty. Up and up it shot. The roar almost drowned our excited yells. Then another, another, *another!* Section after section of that wall, two or three hundred feet high, toppled slowly forward as in a nightmare, then down in one terrible breath-taking cataclysm. We stood transfixed, shrieking at the top of our lungs. Spray and huge blocks of ice were flung a hundred feet into the air. And at the foot of the glacier there rose a great crested tidal wave, coming towards us. The *Westward* turned and fled. Our protection, such as it was, lay in the myriad of small bergs which lay between us and the glacier's face. Against them and over them the successive tidal waves broke their force, and finally reached our running ship only as long even swells.

A VIEW OF MOUNT FAIRWEATHER RANGE FROM GLACIER BAY

It was here that the party succeeded in photographing the whale and got some thrills when the glacier fell

THE WESTWARD NOSES INTO GLACIER BAY

Here is the stalwart craft about five miles from the face of Muir Glacier with thrills ahead

A SECTION OF THE GREAT ICE WALL OF MUIR GLACIER

In the center can be seen water thrown by the first of the great breaks in the glacier front seen by the party

We gathered up our empty cameras. We had had enough. We had come to see a great solid wall of ice, and we left it pitted and serrated with canyons, disintegrating before our eyes. Our good fortune was undoubtedly due to the fact that we had arrived on the afternoon of the first warm sunny day in some time. A great deal of ice had accumulated and was ready to yield to the melting influence of the sun.

The ice field still sparkled and snapped in the sunshine as our good ship plodded her way out. It was only late afternoon in our first day in the ice, yet there was not one that did not feel like an experienced polar navigator. The *Westward* pushed on down the inlet and back into the main part of Glacier Bay, while all of us ate supper.

At seven-thirty next morning Jack called the *Westward's* people to breakfast. Now we would resume our search for whales. Finley had himself hauled to the masthead, one set of flag halyards being used to suspend a sack with his two cameras, while the other set of halyards served for lowering empty cameras to be loaded. Three or four miles from Berg Bay we sighted the first whale. There were a pair of them rolling and blowing, side by side. Usually the whales stayed beneath the surface about three minutes between blows, but when we saw their flukes raised vertically at the dive or when one showed an unusual amount of curving hump we knew that they would sound deeply and we might not expect to see them again for five or six minutes. The two whales stayed closely together, almost like a team, but one nearly always showed its flukes on the deeper dives, while the other never did. Several times we were close enough to see the ragged edges of the flukes and were rather surprised to note that one whale seemed to be all black underneath the flukes instead of exhibiting white splotches as humpbacks are supposed to do. For this we had no explanation. Once he was so near that we could see barnacles adhering to his back. About three or four miles south of Willoughby Island we jockeyed back and forth. About twelve-thirty, Jack came out to announce lunch. Finley at the masthead and I on the pilot house alone refused to be budged, even though a cold wind had been blowing all morning.

No sooner had the decks been cleared, except for Finley, myself, and the skipper at the wheel, than things began to happen. Several times the two whales rose close to the bow. Then at last the *Westward's* latest maneuver seemed to be perfectly timed. "She's coming up!" yelled Finley from the masthead. One great black shadow rose very close to the port bow. "Watch for the other one!" came the cry from aloft. There, right under the stem of the ship, was a swirl of water. Something dark drew nearer and nearer to the surface. It rose. As the big camera went into action, there was a tremendous swirl and splash. Then the boat shook as it collided with the whale. Out of the dining room catapulted the other passengers just in time to see the whale disappear.

All hands had lunch and once more we ran towards the end of Willoughby Island. After an interval, again came the cry of "There she blows!" Evidently, this was the same pair of whales, but they appeared to be rather canny and finally were lost to view for some time. The *Westward* took after another single whale, but it, too, disappeared. We consulted and decided to run clear around the island. Hardly had we opened up the other side when, about a mile away and dead ahead, we saw the most thrilling sight that may ever come to a whaler. Two whales were breaching, jumping far into the air in their play and landing on their backs with a tremendous smack. Again and again they did it, sending up fountains of spray. With each repetition every man aboard cheered with all his might. Full speed ahead, the *Westward* rushed towards them. Nearer and nearer we came. Our first thought was that the humpbacks were being attacked by killer whales, but when we came nearer we saw that they were merely "lobtailing", as the expression goes—that is to say, both whales were standing, heads downward, with their flukes pointed skywards, and lashing these from side to side. Then again they would breach. Our engine was shut off and we crawled quietly nearer with the gasoline auxiliary. Now we could see that before each tremendous leap the creatures raised their flukes into the air as if to sound. They dived downwards a short distance and then shot for the surface at full speed, launching forty- to fifty-foot bodies into space and falling back again in sheer joy of power. We were closer now, yet the performance kept up, and picture after picture was recorded. Then abruptly the whales tired of their play and sounded, this time for nearly twenty minutes. Several times we saw them again, but could not approach near enough. But, after all, we had seen them at their best, and were content to try no more.

ROE DYKEMAN

THE HUMPBACK BREACHES

It shot almost clean of the water, then fell over on its back

THE WHALE HURTLES IN AIR

They dive deeply, then shoot for the surface at high speed

Mrs. Herbert Hoover places a Washington memorial tree on behalf of the Elmira College Club. The President's wife helps dedicate a tree on the grounds of George Washington University. Cynthia Crocker is holding the college banner, Mary Jane Cricher, in costume, presents a bouquet to Mrs. Hoover. Others are Mrs. C. O. Ward, Mrs. Emerson Liscum and Miss Esther H. Hart of the Elmira College Club. The tree is registered with the American Tree Association

WHERE SHALL WE PLACE THE WASHINGTON MEMORIAL TREE?

BY R. B. HULL
PURDUE UNIVERSITY

• • •

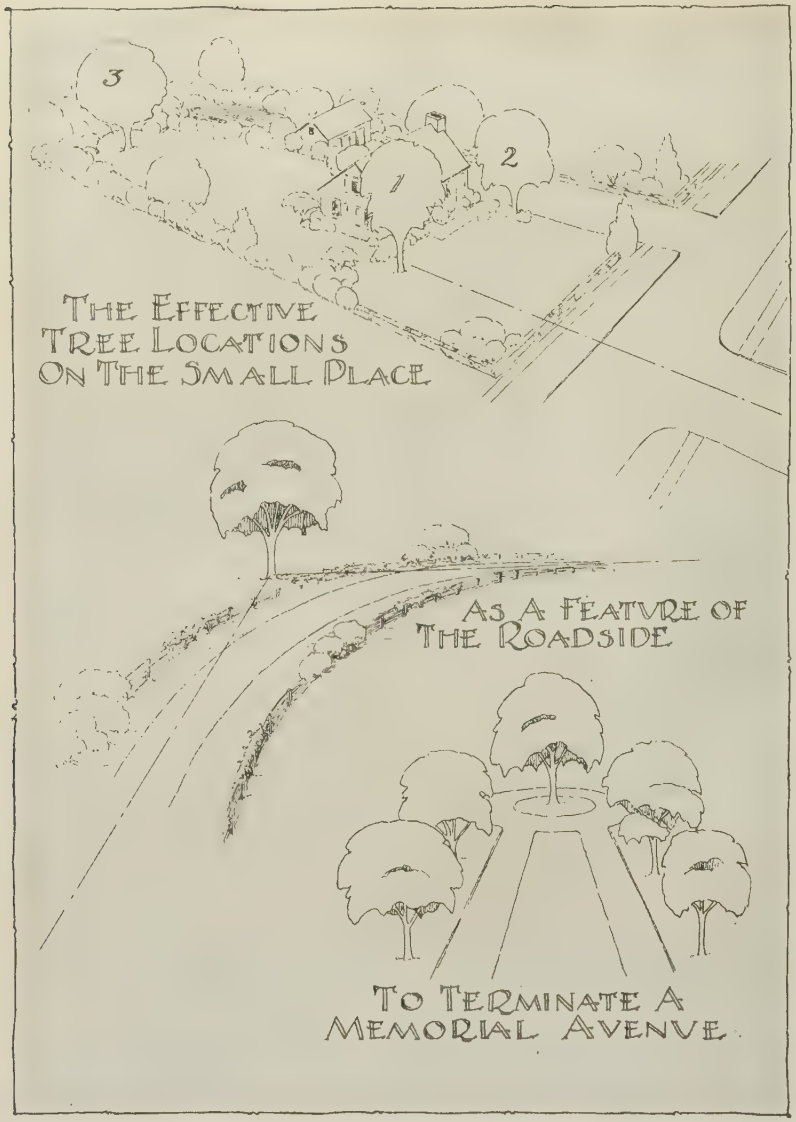
It is highly appropriate that the memorial to a farsighted statesman be planned with an eye to its effectiveness in the landscape many years hence.

The thoughtful plantsman will have selected an outstanding and rugged tree for the Washington memorial and the prospective site for this tree should be studied carefully before the hole has been dug.

There is a mixture of humor and pathos in the annual tree planting of many American families.

More than fifteen million tree plantings in honor of George Washington have been registered on the national honor roll of the American Tree Association in Washington. Is your name on the list of those planting a living memorial to the first President? If not you should plan to plant and register your work. The association will send you free tree planting instruction and registration blank. In thousands of places tree planting is the major project in the Bicentennial program.

Let us open the scene with the removal from its wrappings of the tree that has just been delivered and which now has become the subject of a lively family conference. Father, with the tree in one hand and the spade in the other, has just discovered an oversight in the earlier plans for the planting enterprise. The real issue is defined by his half surprised query, "Well, now we've got it where are we going to plant it?" The problem is rarely solved quickly and to the satisfaction of all con-



cerned—including the tree. The member carrying the tree and shovel will usually compromise—for after all the thing must be gotten into the ground—a practical consideration that often triumphs over the esthetic.

But the Washington memorial is to become a prominent landmark—let us hope. Long years from now it should bear mute testimony to the patriotism of the planters. To a great extent it will also reflect any good taste and esthetic appreciation of these planters evidenced in the choice of location.

The problem of the proper location of the Washington Tree resolves itself into two phases: that of the tree to be planted by the individual on private grounds, and that of the tree to be planted by an organization on public or on private grounds. In each case the tree may be so placed as to be enjoyed by all the passers-by and in many cases may be made to figure in the broad effects of the landscape.

The owner of the small place in town will be somewhat limited as to the possible locations. If by chance his property terminates a street or is on the outside of a curve in the street, the tree may be placed near the axis of the street to be seen by the approaching traffic as a fine termination of the street vista. In some cases the tree might be sufficiently near the dwelling to become a part of the composition here. Tree number one in the diagram is so located.

There is no rule in the Washington Memorial Tree planting program that would limit the planting to one tree. Indeed two trees might well be planted on the home grounds to frame the dwelling as seen from the front. These might be matched trees of the same species and variety. Trees numbers one and two of the sketch might be American elms, white oaks, or other long-lived and stately trees.

If the planting at the front of the grounds is complete, the memorial tree might become the dominating feature of the private lawn or the flower garden. Tree number three of the sketch might be placed on the axis of the living room window—a feature to become year after year a more endearing part of the traditions of the home.

To the dweller in the country the Bicentennial tree planting is a challenge, indeed! Here the possibilities are legion. To those suggested for the small grounds may be added the frequent excellent sites along the roadside where a shapely tree might be seen for miles by the approaching traveler.

The over-mature trees of rural pasture lands are a common sight in most farm sections of America. Here and there young trees are being planted and protected to replace these—to the advantage of the owner and the conservation of landscape beauty. This is an activity that commends itself as a fitting part of the memorial tree planting program.

Landmarks of the countryside such as outstanding knolls might afford admirable settings for fine specimen trees, which properly planted and protected might become inspiring features in the landscape.

The planting of memorial trees by organizations requires the best of leadership. Chairmen of their committees suffer many handicaps for want of clear cut principles to guide them in the selection of tree and site. Valley Forge may seem only mildly rigorous to the planting committee when winter has passed and out of the conflicting opinions, demands and clash of personalities, a George Washington Memorial Tree has been planted.

Whether the organization elects to plant its memorial tree or trees on the grounds of public buildings or on park lands there is a fine opportunity in most cases to so locate them as to make them prominent features in

the street vistas. Needless to say a tree should not be so placed as to divide the façade of a public building in an awkward manner—particularly if the building has architectural merit. If the committee will secure photographs of the proposed site taken on the spot from which it will be most frequently seen these may be studied to advantage. The outline of a tree drawn upon these photos in all the locations considered will furnish an excellent means of deciding upon the most desirable site.

In any park site, the committee will do well to consider the landscape plan, if one has been prepared, and it need not be added that the memorial plantings should fit into the design of the existing plantings.

It will usually be found that city planners, architects and landscape architects are glad to cooperate in enterprises of this nature. Certainly, the planting by organizations upon public grounds should be in cooperation with any existing city-planning or art commission.

In some instances organizations and municipalities are planning memorial avenue plantings. In such cases the trees should be planted under the direction of the city forester rather than to leave the selection and planting to the individual property owner.

Naturally, no tall growing trees should be planted under existing utility lines that are permanently located. In such locations low growing trees might be planted. The writer has seen a beautiful row of Washington thorn trees which, while never reaching a height to "enter into foreign entanglements", were a landscape delight.

The planting of 10,000,000 trees was the goal set by the American Tree Association in the Bicentennial Memorial program. This goal is being greatly exceeded.

As a fine patriotic rite, the program was admirably conceived; as a means of directing the public interest to the part that reforestation must play in a long-time land-planning policy it is effective, and as a means of increasing the interest in trees as Nature's relief from man-made ugliness, it could not be a better choice.

WHAT BETTER MEMORIAL THAN A RECLAIMED SPOT?

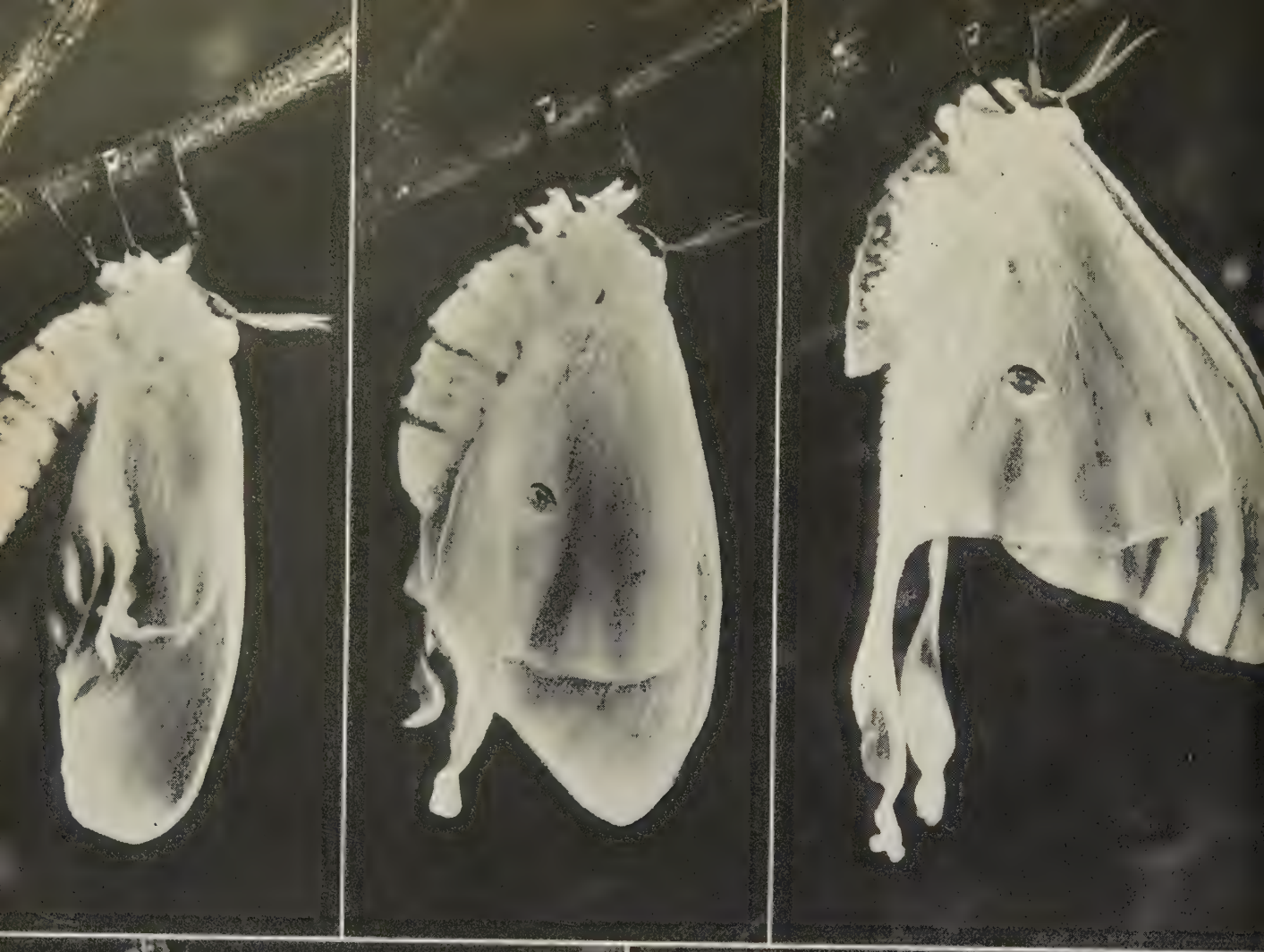
A forest planting as a windbreak or to reforest a denuded area is an appropriate act in commemoration of the achievements of Washington

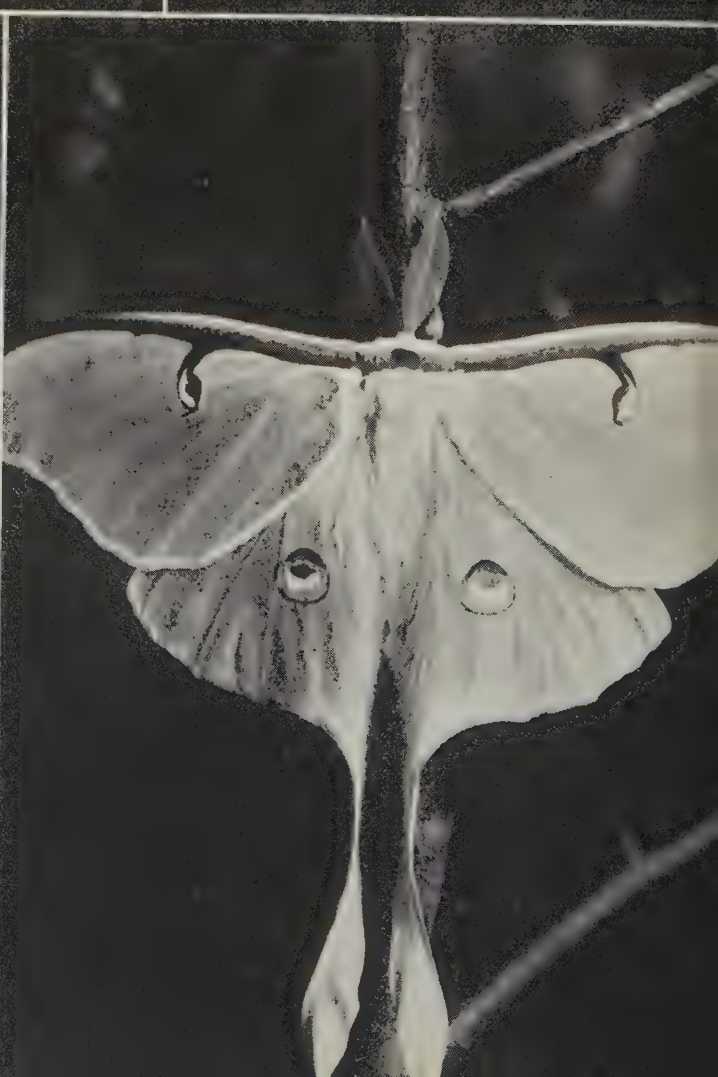
THE HOME LAWN HAS VARIOUS SPOTS FOR A NEW TREE

Planted in a well-chosen spot, the tree dedicated to our first President will be a welcome reminder today, tomorrow and for many tomorrows

OR AN EXCELLENT SPOT MAY BE FOUND IN A PASTURE

Thus affording shade as well as beauty. In selecting such sites, however, care should be taken to provide protection against mechanical injury



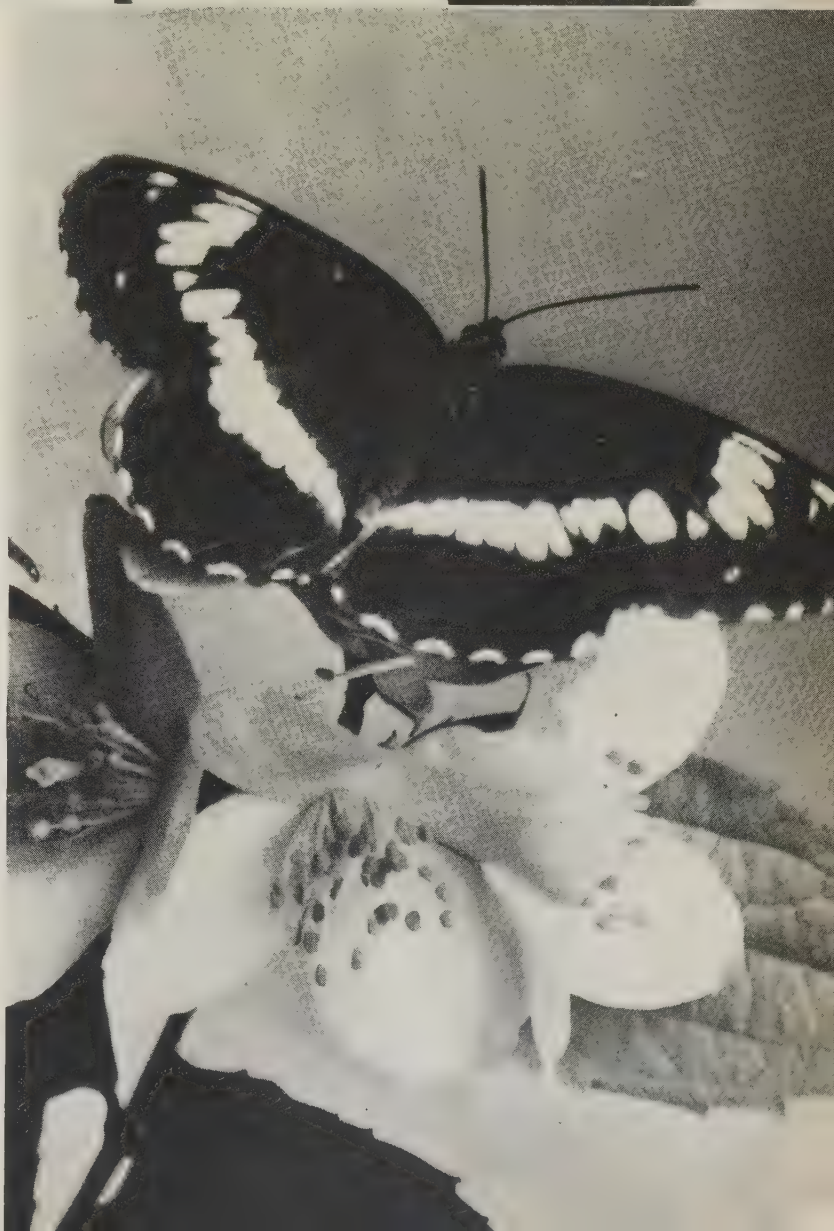


METAMORPHOSIS

Here has photographer Ernst Krause of Berlin caught for us some episodes in the marvelous life of moth and butterfly. He has pictured such a story of the evolution in the life of a species as can never fail to thrill the student of life.

At the left we see the luna moth newly emerged, wings still damp and folded, hanging from a twig. Rapidly the air dries the wings, and the long trailing ends, so distinctive a characteristic of this lovely moth, extend downward. The gorgeous, delicate wings are spread out, giving promise of beauty and vibrant life. And then the luna is shown us in all its glory, a perfect adult moth.

On this page we have another story. First we see the ugly horned caterpillar feeding on his favorite leaf, from which he finally hangs head down. Then he encases himself in a curious cocoon hardly prophetic of the lovely creature that is to emerge and to rest finally in all his spreading beauty on a fragrant bloom.



HYLA—
TREE FROG

BY GAYLE PICKWELL

PHOTOGRAPHS BY THE AUTHOR
AND PAUL WALKER

• • •

HYLA REGILLA—WESTERN TREE FROG
Like Hyla crucifer, the spring peeper in the east, he announces spring

NOT EVEN gentle whispers of hidden and dying snow or gurgles of newborn rivulets seeking the sea, nor catkins of pussy-willows nor tang of bared and softened soil, not these alone will make a true March unless with the evening "thief, thief" of newly-arrived robins there comes also the cadence of Hyla the spring peeper.

Soon from every pool, from every ditch, from every pond the chorus rises. Woodland bogs with skunk cabbage on their margins, meadow hollows brim full with water that was but lately snow, marshes with the feet of last year's cattails still in their midst—all echo at evening with these shrill voices.

From the roadside ditches, above the motor's noise, they make themselves known. At every stop of the train their notes come to the sleeper in the Pullman. And to one who, at home, steps out to draw, lung-full, the air of March there comes a vibrant throb. It is the effect of the peeper voices in great multitudes.

How much a part of spring they are! Who has not exulted with the promise that the first peepers bring? But how many have searched them out where they shrill by their pond or puddle? How many have stood amazed at the littleness of the object from which a voice comes that may carry, in the quiet of evening, for a mile or more? For *Hyla crucifer,* the spring peeper, in spite of his voice, is no bigger than the first joint of an average thumb!

A MIDGET IN FROGDOM
Just thumb-joint size when grown up but with a voice that will carry a mile or more

But here we are concerned chiefly with the peeper's cousin, *Hyla regilla,* the far western tree frog. Like the peeper the western tree frog announces spring; like the peeper he has a voice all out of proportion to his size; but where the peeper says "pee-eep", this one in the West says "scratch-it."

Outside my laboratory window is a monkey puzzle tree. The monkey puzzle tree, odd though it is, has very little to do with this story except that beneath it is a heavy mat of English ivy. And in this ivy is the home of a western tree frog.

In the far West it is a bit difficult to tell just when spring begins and it is possible that *Hyla crucifer,* if transferred here, might misjudge it altogether and announce spring when the rains begin in December, that being the only thing comparable to March in the east. But *Hyla regilla* is not deluded. Spring begins at the end of January when alders bloom just as blooming alders in March announce spring to peepers three thousand miles away.

So it came about that as January was running into February and the alder catkins in the canyons were shaking their pollen into the wind, there arose outside my window beneath the monkey puzzle tree in the ivy vine, one cloudy day, a loud voice that said

"scratch-it, scratch-it." I knew that Hyla knew that spring had come. For about a week Hyla announced the event and then there was no more of "scratch-it."

Now the Guadalupe Creek has its bed and its puddles about a mile from my window, monkey puzzle tree and ivy vine. At first thought there should seem to be no connection or significance in this fact. But an evening or two after *Hyla regilla* ceased saying "scratch-it" by the window I hunted out the Guadalupe with its bed and its puddles. Hyla was there sure enough, saying "scratch-it" louder than ever and, what's more, it seemed that ten thousand other Hylas had come down, too, so terrific was the hubbub.

It's a curious thing about toads and tree frogs, this spring clamor and searching for water. For eleven months in the year the ivy vine was good enough, but spring with alder catkins makes a tremendous difference. Here Hyla had gone more than a mile that he might find water to say "scratch-it" in wet bliss. And a mile to a midget the size of the last joint on your thumb is equivalent to many, many miles for a human traveler.

A DRUM AS LARGE AS THE DRUMMER

With it Hyla causes to resound his curious call, that sounds to us like "scratch-it, scratch-it"

Yet Nature works in a reasonableness for the most part. Toads, salamanders and frogs, including most Hylas, have never succeeded in getting themselves entirely out of the water. Whatever they may do, grown up, with the major part of their time, most of them must once a year find water wherein to find mates who will lay eggs that produce tadpoles. The tadpoles stay in the water for some weeks; then they grow up, lose their tails, leave the water and hunt around to find, perhaps, an ivy vine beneath a monkey puzzle tree just like their fathers before them.

However, to come back to the grown-up *Hyla regilla* who had hopped a mile to the puddles of the Guadalupe. We found him, or one that looked so much like him it didn't matter, and most amazing he appeared! All green

HYLA ON A WINDOW GLASS

On his fingers and toes are suction pads for clinging to such surfaces

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SAYING "SCRATCH-IT" IN WET BLISS

Hyla, needing water for mating and for trilling, may go, in spring, a mile to find it

he was in the ivy vine for there his surroundings were green. But here he was dirt brown with curious checker markings and he looked so much like the mud he sprawled upon that our best flashlight methods of picture taking were none too good in showing him. This ability to use the color that suits, whether it be brown with black spots or all brown or all gray or all bright green, is one of Hyla's most wonderful qualities. But there was something more wonderful than color protection in this Hyla in Guadalupe. That was his lower chin.

There, on his lower chin, extending down to his forelegs and up around his nose was a bubble like a balloon; a bubble big as Hyla himself, or rather as big as all the rest of him put together. For this bubble was part of him, nothing more or less than the skin of his lower jaw blown out to form a drum. And into his drum Hyla was saying "scratch-it, scratch-it," over and over and over. With each "scratch-it" the bubble puffed out bigger than ever and in between notes the place where his ribs would be, if he had any, would swell up with the breath he intended to use in saying the next "scratch-it." All in all, when going good, he gave his call about once every second or so, which would mean, if nothing happened to stop him, that over thirty thousand "scratch-its" would be necessary to get a night by.

Occasionally something would stop him, however, such as, for instance, something making a loud splash nearby or the rumble of a distant train or car. Then he would become quiet suddenly, letting his bubble float on the water in which he sprawled. If another splash came or the rumble grew too loud he would sit upright and give a big gulp, whereupon that bubble of the under chin would disappear promptly just as if swallowed, and the puffed out sides would suddenly cave in with a big lost breath, all of which would make of Hyla a little midget not over thumb-size again.

When splashes ceased and train rumble died out into the distance intense stillness would prevail. But after a moment some Hyla, with his overpowering, indefinable urge to call, would pump up his balloon and start again. Very shortly every tree frog in the pond had joined in the refrain of the leader.

After Hyla had been at the puddle on the Guadalupe for some days calling, the quiet female frogs came down, no longer able to resist the call of spring and the persistent serenade. With the arrival of the females, mating occurred and soon curious little masses of eggs, like tiny grains of tapioca in jelly, were attached here and there to fallen twigs in the water. From the eggs tadpoles were predestined to emerge in a few days, and before long a new crop of tree frogs would be due to leave the water and to spread out over the land.

Not caring for tadpole offspring, Hyla will shortly come back to his ivy vine beneath the monkey puzzle tree beside my window. I shall know it because, no doubt, a few short notes will come again, last vestiges of the great call of earlier days. Gone then the alder catkins, gone the urge of spring, gone the ache for travel and for water; comes instead a peaceful little tree frog content to remain eleven months until again February brings the world new catkins and his call of "scratch-it."

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EXAMINING AN INFECTED ELM

A member of the U. S. Department of Agriculture staff studies the ravages of the Dutch elm disease

A NEW ELM PLAGUE

BY CLYDE H. DUBOSE

THE United States government recently made an appeal to all tree lovers of America to join the crusade now searching for the insidious "Dutch elm disease," a new menace to elm trees, discovered for the first time in this country last year.

The disease, which began in Holland in 1929, has spread to practically all European countries and jumped to the shores of our country, although just how this "jumping" process came about no one knows. After finding three affected trees in Cleveland, Ohio, and one in Cincinnati, last year, government officials have been investigating every possible source of entry into this country.

This year four more trees affected by the brownish discoloration of the sapwood have been reported by the United States Agricultural Experiment Station established at Wooster, Ohio, for the purpose of exploring the affected areas.

Pathologists, foresters, tree repair men, and tree lovers everywhere are urged by the government to be on the lookout for wilting elms, and to submit specimens to the Dutch Elm Disease Laboratory at the Ohio Agricultural Experiment Station, Wooster, Ohio.

THE DISTINGUISHED DELPHINIUM

FROM JUNE UNTIL FROST THIS FLOWER ILLUMINES THE GARDEN SCENE

BY DOROTHY E. PLETCHER

PHOTOGRAPH BY J. HORACE MCFARLAND

CERTAINLY THE QUEEN OF BLUE FLOWERS

Its inclusion in the garden is something that becomes a habit with any flower-lover

WHEN, over a hundred years ago, the Nature-loving Wordsworth wrote of flowers, "All kinds alike seemed favourites of Heaven", how was he to know that the twentieth century would produce a celestial favorite? One suspects that were a poet to write thus impartially of flowers today, he would instantly precipitate an uprising of delphinium fans demanding that he extol their flower above all others. If there is any scepticism as to the strong hold this gloriously blue flower has on the affections of mankind, just grow some in your own garden, and you will find yourself immediately planning to raise more varieties the coming season and wondering why you didn't see its possibilities sooner.

With a singularly wide range of both color and size, in addition to its willingness to go on blooming from June until frost, this "Queen of Blue Flowers" commands our attention. Its blue, lavender and purple spikes form stunning pictures, the riot of color reminding one of scenes from fairy books. Indeed, many is the gardener who has forsaken all his other garden loves in his admiration for the delphinium, spending years in contributing to its advancement from an original state of wildness, up through the old English hybrid stage to its present place of distinction among flowers. Obviously the delphinium's story is a composite of the stories of these men whose lives are interwoven with the life of their chosen flower; each has contributed some hitherto unknown possibility—a new color, a variety possessing a double form, and so on and on. And for these changes we are indebted both to English and American hybridists.

In this country we point proudly to Mr. O. M. Pudor, who, for almost twenty years, out in the State of Washington, has been steadily breeding strong, healthy plants astonishingly free from disease. The variety known as "Pudor's Glory Strain" with its huge spikes of single and semi-double flowers in numerous shades of blue and lavender, alone is ample proof of what he has accomplished.

And then there is that well-known Californian who leads the fascinating dual life of hybridizer and soldier—Major Newell F. Vanderbilt. We have him also to thank for plants with a wealth of color, a strong resistance to

PHOTOGRAPH BY J. HORACE MCFARLAND

MUCH WORK AND RESEARCH HAVE BEEN DONE

Hybridists both in England and the United States have contributed to the development of new and beautiful strains

disease, and a mild fragrance. During the course of his experiments with delphiniums he had been growing Burbank's sort, which were far from satisfactory because they mildewed easily. Then one day when on a trip in the Sierra, he came upon a wild species—*Delphinium scopulorum.* Curious and eager in his quest for a perfect specimen, he instantly decided to cross this wild type with Burbank's. He crossed them so well—this was in 1911—that four years later the hybrid won for him the Panama-Pacific Exposition Medal. He even produced sorts able to thrive in California, which, as everyone knows, had always been an unfavorable location for the pretty blue spikes.

For that delightful pure white, "Summer Cloud", we are indebted to Mr. William Toole of Wisconsin. He is also prominent in the world of flowers for his tireless interest in conserving the West's wild flowers.

The double true white variety is the result of Mr. Charles F. Barber's investigations. Mr. Barber, a native of Oregon, has also developed many new color combinations in delphiniums noted for their extreme hardiness. And of course there are many other eminent names in American delphinium research.

Crossing to England, we find delphinium enthusiasm there as warm as it is in our own country. Mr. Watkin Samuel needs no introduction to those who love flowers. Although in 1917 the Royal Horticultural Society was busy giving the Award of Merit to such varieties as Belladonna grandiflorum, Capri, and numerous others, it remained for the Wrexham delphinium in 1921 to astound the judges. Mr. Samuel, who lives in the little picturesque town of Wrexham in North Wales, is the flower wizard who raised it. This case of Mr. Samuel and his Wrexhams is an excellent example of the patience and energy needed in introducing new flowers. For twelve long years he had worked inconspicuously, diligently, tirelessly over his delphiniums, but he did not and would not take them to London until he thought they were perfect enough to go. The result was that when he did take them, London went wild over them. So statuesque, so beautiful were they, so entirely different in type from anything ever before seen among this flower clan, that they immediately took no less than five Awards of Merit and have had volumes of praise sung about them ever since. People exclaimed, "Don't they look like hollyhocks?" So they did. Thus it was that the name became attached to them permanently. And that is the story of our strikingly lovely Hollyhock delphiniums.

Naturally, everyone wants to have a succession of flowers throughout the summer, so that the paramount question seems to be, "How can we get a long period of bloom?" One can have delphiniums in the fall. "Delphiniums in September and October?" queries the novice. Certainly. And there are two ways in which to accomplish this. If, as soon as the flowers pass, the plants are immediately cut down to the ground, and some fertilizer is worked in around them, a second crop of flowers will put in an appearance. It must be hastily added, however, that this method, like every amazingly good proposition, has its drawback. A second crop undoubtedly weakens the plants, thereby leaving them susceptible to disease. Because of that, the best plan is to refrain from cutting them down, merely removing the old flowers and seeds, and as a result, the plants will be unusually vigorous and impervious to disease the following year.

The other method—and this is by far the best one—is

to make sowings of seed of "chinense" (Blue Butterfly) and the "belladonna" and "formosum" hybrids in early June near some well-grown clumps of delphiniums, for which one will be more than amply rewarded during those dubious fall months, with the intense gentian-blue of the Blue Butterfly, the turquoise blue of the "belladonna" and the delightful dark blue blossoms of the "formosum." And of course Mr. Watkin Samuel's Hollyhock must not be omitted. Its tendency toward a remarkably long period of bloom is the very quality that has made it so popular and widely sought after.

When looking over the flower catalogues before ordering seeds, it is a good plan to keep in mind the fact that there is a multiplicity of needs for an ideal garden and that the nurserymen can offer a flower for every need. For instance, one wishes to have the inside of his home as well as his garden brightened with the delphiniums' heavenly colorings, and accordingly he will find that there are varieties especially for cutting purposes. There are others for massing; there are even some for the rock garden.

For cutting we are offered our lovely "belladonna" which we planned to sow for fall blooming, and the Chinese Larkspur, a dwarf species that has fern-like foliage and blooms of a gorgeous Copenhagen blue. Dull, drab interiors are instantly transformed when flowers such as these beauties come indoors.

PHOTOGRAPH BY J. HORACE MCFARLAND

THEY ADD DISTINCTION TO THE GARDEN

They require well-drained soil and may be started in the fall if properly protected by leaf mould for the winter

The rock garden always welcomes airy, winsome "Grandiflorum minor," not even a foot tall, but making up for its lack of height with color intensity.

For massing purposes there are the Gold Medal hybrids. Growing three to five feet high, decorative and important-looking with their flowers of various shades of blue, lavender and purple, masses of these hybrids in June and July always draw the eye—and hold it.

A brave showing is similarly made by "Grandiflorum chinense," known as Slender Larkspur. It easily wins recognition as the best of the lower-growing types, and with its many unusually large flowers of pale blue, blue, lilac and mauve, well—one just can't resist it. From June until August, with this variety, lively blooming is assured.

Concerning this matter of massing delphiniums, it might not be amiss to mention that the up-to-date horticulturist does not indulge in arranging his delphiniums in sedate rows; neither does he mass them on a large scale as he was wont to do in days of yore. He has learned that exceptionally large masses of blue and purple may be deadening in their monotony; incidentally, since the art of gardening is now more studied than it used to be, he has discovered the need for contrasting form and color in his search for the picturesque. And in this connection also, he has found that form is more important than color, and that color is built on form.

In the general scheme of things a background of green is always necessary for a proper display of color in our delphiniums. Recently the writer saw a background consisting of a wall covered with heavy vines over which some large trees of a drooping habit draped themselves—all of which, by eliminating any stiff outlines, lent an air of naturalness to the scene and accentuated the color of the flowers in the foreground.

Because a garden scene composed entirely of blues would be much too cold, we introduce other flowers—yellow ones are ideal—for the purpose of mitigating the blue and supplying a few warm tones. Pleasing indeed are the pictures that may be made by these groupings. *Anemone hupehensis,* a mauve-pink anemone that flowers in August, has proved itself particularly adaptable,

PHOTOGRAPH COURTESY OF WILLIAM C. DUCKHAM

A LOVELY AND EFFECTIVE PLANTING OF DELPHINIUMS

It is generally found best to plant them as here, with backgrounds of green, thus giving their colors a better foil. They are more effective among other flowers than alone

being a happy complement to delphiniums of opal coloring. Clumps of the yellow Day Lily, or perhaps the popular Regal Lily, and, of course, some Evening Primrose and Jacob's Ladder are used; or, if more striking colors are wanted, crimson hollyhocks and orange lilies together with the blue and purple delphiniums will create a scene of the richest splendor. Those who have planted that variety of delphinium known as "Formosum belladonna" against a trellis of climbing roses know that this creates one of the most charming pictures ever devised.

But, getting down to more practical matters—what kind of soil does the delphinium prefer? It is absolutely necessary that it be well drained; and this may be done to heavy soils by adding one-third each of sand, leaf mold and ordinary garden loam. In September, sow the seeds in shallow boxes in a cold frame, placing them about three inches apart; cover them with leaf mold and see that they are well watered. They need to be kept in a dark, cool place for about two weeks. After they have germinated, let them have some light, but at the same time, keep them well shaded for about a month. Then, when they are large enough, transplant them to the garden where, after putting some leaf mold around them, as well as some coal ashes to assist in the drainage, and covering them for the winter with corn stalks or branches —never a heavy covering of manure—they ought to come through pretty well.

We are now hearing a great deal about delphinium blight. Most of the trouble is being caused by a tiny mite which revels in damp, shady locations and is found in the larger buds of infested plants. The tragedy of it is that the flower stalks turn dark and the buds will not open. To combat this, spray around the base of the plants with a good tobacco spray and lime-sulphur; cut down and burn the badly-infested plants. Horticulturists have been studying this pest—are experimenting with it now, in fact—and we are hoping for more suggestions concerning its elimination.

The added knowledge of delphiniums made possible by enthusiasts for the flower has made this world a brighter and happier place in which to live. May the good work go on, and, in the meantime, there is no reason why all of us should not be successful in growing the "Queen of Blue Flowers" and enjoying its charms.

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On the next page starts a special feature in color. This feature, together with eight additional color pages, comprising twenty-four more bird pictures with correlative text, is now available separately in its entirety. See inside back cover of this issue for further details about "Birds of the States."

BIRDS OF THE STATES

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HOW, WHEN AND WHY THEY WERE CHOSEN AS OFFICIAL EMBLEMS

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By KATHERINE B. TIPPETTS

CHAIRMAN, DIVISION OF CONSERVATION, GENERAL FEDERATION OF WOMEN'S CLUBS

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ILLUSTRATIONS

By R. BRUCE HORSFALL

ART DIRECTOR OF NATURE MAGAZINE

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DESCRIPTIVE TEXT

By CARRA E. HORSFALL

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INDEX TO OUR STATE BIRDS AND FLOWERS

STATE	BIRD	CHOICE INITIATED BY	ADOPTED	STATE FLOWER
Alabama	Flicker	Ladies Memorial Asso.	1927 Legislature	Goldenrod
Arizona	Cactus Wren	†State Federation	1931 Legislature	Sahuaro Cactus
Arkansas	Mockingbird	State Federation	1929 Legislature	Apple Blossom
California	California Quail	Audubon Societies	1931 Legislature	Golden Poppy
Colorado	Lark Bunting	State Audubon Soc'y	1931 Legislature	Columbine
Connecticut	None Selected			Mountain Laurel
Delaware	Cardinal	State Federation	*Next Legislature	Peach Blossom
Dist. of Columbia	Woodthrush	District Federation	1927 Commissioners	American Beauty Rose
Florida	Mockingbird	St. Petersburg Audubon	1927 Legislature	Orange Blossom
Georgia	Brown Thrasher	State Federation	Next Legislature	Cherokee Rose
Idaho	Mountain Bluebird	State Federation	1931 Legislature	Syringa
Illinois	Cardinal	State Federation	1929 Legislature	Violet
Indiana	None Selected			Tulip Tree Flower
Iowa	None Selected			Wild Rose
Kansas	W. Meadowlark	Audubon Society	1925 School Children	Sunflower
Kentucky	Cardinal	State Federation	1926 Legislature	Trumpet Vine
Louisiana	Brown Pelican	On State Seal	1902 State Seal	Magnolia
Maine	Chickadee	State Federation	1927 Legislature	White Pine Cone
Maryland	Baltimore Oriole	Catesby	By Long Custom	Blackeyed Susan
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Michigan	Robin	State Audubon Soc'y.	1931 Legislature	Apple Blossom
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Mississippi	Mockingbird	State Federation	Next Legislature	Magnolia
Missouri	Bluebird	State Federation	Popular Vote	Hawthorn
Montana	W. Meadowlark	State Federation	1931 Legislature	Bitterroot
Nebraska	W. Meadowlark	State Federation	1929 Legislature	Goldenrod
Nevada	Mt. Bluebird	State Federation	Next Legislature	Sage Brush
New Hampshire	Purple Finch	State Federation	Popular Vote	Purple Lilac
New Jersey	None Selected			Violet
New Mexico	Roadrunner	State Federation	Next Legislature	Cactus
New York	Bluebird	State Federation	Popular Vote	Rose
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Oklahoma	Bobwhite	State Federation	Next Legislature	Mistletoe
Oregon	W. Meadowlark	State Audubon Soc'y.	1927 Gov. Proclamation	Oregon Grape
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Rhode Island	Bobwhite	State Federation	Next Legislature	Violet
South Carolina	Carolina Wren	State Federation	Next Legislature	Yellow Jessamine
South Dakota	W. Meadowlark	State Federation	Next Legislature	Pasque Flower
Tennessee	None Selected			Passion Flower
Texas	W. Mockingbird	State Federation	1927 Legislature	Bluebonnet
Utah	Sea Gull	People's Choice	1913 Gull Monument	Sego Lily
Vermont	Hermit Thrush	State Federation	Popular Vote	Red Clover
Virginia	Robin	School Children	1912 Legislature	Flowering Dogwood
Washington	Willow Goldfinch	State Federation	Next Legislature	Rhododendron
West Virginia	Tufted Titmouse	State Federation	Next Legislature	Rhododendron
Wisconsin	Robin	State Federation	School Children	Violet
Wyoming	W. Meadowlark	State Federation	1927 Legislature	Indian Paint Brush

†State Federation—State Federation of Women's Clubs
*Matter will be brought before next Legislature

The fact that so many of the States have chosen official State birds is in no small measure due to the leadership of Mrs. Tippetts as a national chairman of the General Federation of Women's Clubs. Her inspiration has stimulated the fine campaigns conducted in the various states and has furthered the cause of conservation, Nature study and bird protection to a valuable extent. It is a pleasure to present in the pages of Nature Magazine the colored pictures of the different birds accorded State honors together with the interesting and valuable text matter.

ARTHUR NEWTON PACK,
President, American Nature Association.

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SELECTING STATE BIRDS

By KATHERINE B. TIPPETTS

FORTY-THREE of our States and the District of Columbia have selected a bird to represent them as an emblem. In the majority of the States this popularly-chosen avian representative has been officially recognized and in the other states it is planned to have this done at early legislative sessions.

The mere fact that these bird emblems have been chosen is not important so far as the emblem itself is concerned. What is significant is that which led up to the selection; the discussion, study, and thought that it required: the very real educational service that it performed. And the result is that affectionate interest has been thus aroused in all birds and their protection.

When the first query went out, "Have you a State Bird?" it was virtually a new thought. Aside from Louisiana, Maryland and Utah, where custom had already established official birds, and Kansas, where a successful early campaign was held, inquiry revealed that there were no state birds. So campaigns were started, taking most effective form in drives by women's clubs, Audubon societies and Nature groups in cooperation with the schools to "get out the vote."

Quickly these campaigns grew into crusades. Many candidates were entered. Their qualifications were discussed from all angles. Inquiry brought out whether the birds nominated were valuable economically; whether they were truly representative of the region; what their distinctive characteristics were; whether they were attractive songsters, and many other details. An awakened interest in birds and their study and a greater interest in Nature Study were quickly noted. Balloting was active and the votes cast were well-considered decisions. Beyond all question the value of selecting an official State bird was established.

Naturally in the various campaigns many interesting things developed. It is, therefore, of both value and interest now to review these various campaigns in connection with the reproduction here of these official birds in all their color and beauty.

In 1927, at the request of the Ladies' Memorial Association, the Legislature of Alabama adopted the Flicker, or "yellow hammer", as the official State bird. The members of this organization urged the choice because the Alabama soldiers in the Confederate Army were known as "Yellow Hammers", and the yellow lining of the bird's wings and tail recall the uniform colors of the Alabama cavalry.

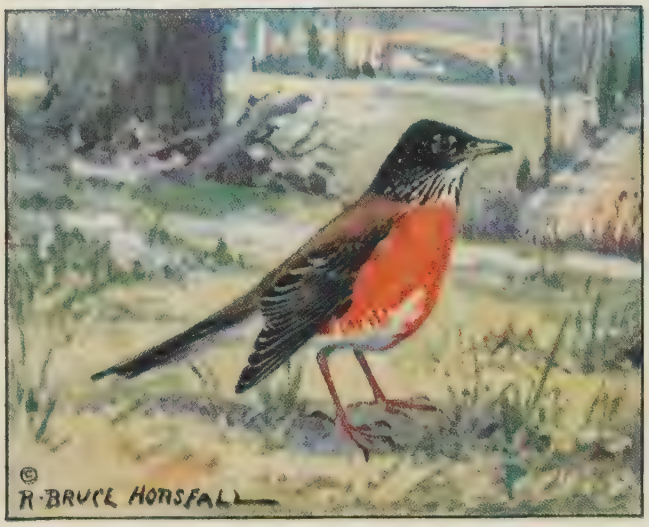
CONNECTICUT LACKS A STATE BIRD
But the ruby-crowned kinglet suggests itself as a good selection

When the General Federation of Women's Clubs accepted the invitation to hold its 1931 Biennial Council in Phoenix, Arizona, Mrs. D. I. Craig, Chairman of Conservation for the State was urged to have a State bird selected before the meeting was held. She wasted no time and a campaign was launched throughout the State. Ballots were cast for various candidates but when these were counted the Cactus Wren was out in front in a run-away contest. A bill making the selection official was immediately presented to the Legislature and passed and signed by the Governor in March, 1931.

In Arkansas the State Federation of Women's Clubs sponsored the Mockingbird for official honors. A campaign was conducted under the direction of Mrs. W. A. Utley, this bird being the overwhelming choice. When the matter was first presented to the Legislature most of the members thought it a huge joke, but when they were given two stirring addresses that told them a lot of things about the value of the mockingbird to the farmer, they voted unanimously for the measure and it was signed by the Governor in 1929.

The California Audubon Society and kindred groups sponsored the campaign for a State bird for the Golden State; and great interest it aroused, too. Ballots containing the names of twenty-five birds nominated for selection were widely circulated and just as widely marked. The count revealed the Valley Quail in the lead, and on June 12, 1931, the Governor made the choice official.

In Colorado the selection of the Lark Bunting came at the climax of a campaign which was conducted by ardent partisans. The movement for a State bird was started by Miss Katherine Craig, then superintendent of public instruction. Ballots with the names of the robin, mountain blue-bird, long-crested jay and western meadowlark were circulated and in this vote the



ROBIN—*Turdus migratorius migratorius*

MICHIGAN, VIRGINIA, WISCONSIN

The Robin is State Bird for Michigan, Virginia and Wisconsin. Because of its wide distribution throughout North America and its willingness to live about the habitations of man, this bird is the most intimately known song-bird. The spring song of the robin is assurance that winter has passed. This bird builds early, often sitting upon eggs during late spring falls of snow. The bulky nest is made of rootlets and grasses with a mud-plaster partition between the outer wall and the lining of softer materials. The three to five beautiful blue eggs hatch into speckled-breasted babies, thus showing their thrush character. Usually two broods are raised. Both birds share in the care of the children, feeding insects and worms aggregating the weight of each baby, daily. When the first brood is off the nest and the mother is busy with the second family, the males and first broods flock to moist woodlands. When fall comes the entire robin population of a neighborhood collects for migration and joins others to make up immense robin-roosts in the cedar thickets of the southern states. Some robins are only locally migrant.

MASSACHUSETTS

Veery, a member of the Thrush family, is State Bird of Massachusetts. It comes from its winter home in South America, to central Iowa, eastward to New Jersey and northward to central Canada and Newfoundland. It breeds throughout this territory, choosing moist woodlands where the ground is densely covered with brush and undergrowth. In such a place the nest is built upon or near the ground, the bird using rootlets, bark strips and leaves with finer similar material for the lining. The three to five eggs are greenish blue and laid late in May or early June. In common with other thrushes, the veery feeds upon insects which are reasonably abundant in his habitat, and on wild fruits. His back is plain olive brown and the spots on his creamy breast are fainter than on other thrushes. He is the shyest, most retiring of thrushes and is known better by his song than by sight. This song is a two-toned, vibrant rendition of slurred triplets which speaks of the mystery of the deep, deep woods; weird and haunting as each repetition lowers in tone and diminishes in volume until silence dominates the woods.

VEERY—*Hylocichla fuscescens fuscescens*

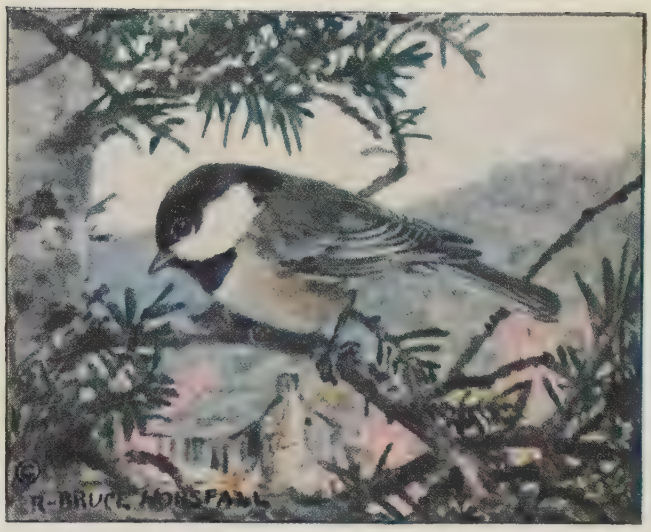
CACTUS WREN—*Heleodytes brunneicapillus couesi*

ARIZONA

Cactus Wren is State Bird of Arizona. It is as typical of the region as the cactus for which it is named. Relatively abundant in the desert lands of southwestern United States and northern Mexico, north to Nevada and Utah, it is probably at its best in Arizona. Here it builds retort-shaped nests with tunnel entrances at the side, in that spiniest of cactuses, the cholla, and in other desert plants. Each pair builds a number of nests and keeps them in repair, adding new long fibers about the doorway and sometimes over the entire nest. Nests not used to cradle the four to seven russet-marked eggs, are occupied as sleeping quarters and winter homes. The food of the cactus wren, largest of his tribe, contains more than eighty per cent of injurious insects while the remainder consists of weed seeds and fruits. His attitude when singing is the most wren-like thing about him. With head back and drooping tail, he abandons himself to his theme. It is truly a song of waste places,—insistent, with little variation, it expresses the constant brilliance of light, the bristling character of his surroundings and his joy of living.

NORTH CAROLINA

Carolina Chickadee is State Bird of North Carolina. This chickadee is resident throughout southeastern United States, breeds in the Carolinas north through central New Jersey, west of Missouri, south into Louisiana and the Gulf coast. It is smaller than Black-cap, that cheerful friend of northern wintry woods; its song none the less cheery, is pitched in a higher key more plaintively and hurriedly rendered with four instead of two notes, as in the Phoebe call of the former bird. It is also shyer and usually chooses more secluded stumps and tree cavities in which to nest and sleep. These, fifteen to twenty feet from the ground, are filled with fine bark-strips, plant down, feathers and grasses. Here the five to eight white eggs with cinnamon spots at the larger end, are laid as early as March. So many babies keep both parents busy hunting for eggs, larvae and adults of injurious insects. A second brood soon follows the first so that there are large family clans ranging together during the late summer, fall and winter. These chickadees are highly useful members of bird society because they destroy countless pests.



CAROLINA CHICKADEE—*Penthestes carolinensis carolinensis*

GOLDFINCH—*Spinus tristis tristis*

MINNESOTA

Eastern Goldfinch is State Bird of Minnesota, which is in the heart of the bird's range covering North America east of the Rocky Mountains from southern Canada south to Oklahoma, Kentucky and Georgia. Throughout the year goldfinches congregate in gay, busy flocks; except during the rather late nesting period. Then a well built, cup-shaped nest of finely-stripped bark and grasses, lined with felted plant down, is placed in shrub, bramble-bush or tree. Five or six pale, bluish-white eggs are not uncommon. Both birds share in the care of the young. In two weeks they are ready to join their elders in the flocks that cover thistle plants by the roadside, alders and birches by streams and in meadows, while gardens furnish them coreopsis, asters and the like. They are seed eaters and very useful in their destruction of injurious varieties—it takes but three minutes to demolish a thistle head with approximately seventy-five seeds. In autumn the male changes the brilliant yellow and black coat for one similar to that worn by the female and young, but retains the darker wings. The common name is wild canary.

COLORADO

The Lark Bunting is the State Bird of Colorado. It is abundant in the western portion of the Great Plains from southern Canada southward, and winters from Arizona and Texas into the tablelands of Mexico. Their brilliant black and white plumage makes them conspicuous while feeding or flying in close formation as a flock. As early as the middle of May, in the fields east of Denver, the males are on the wing singing their melodious songs and chants, similar to bobolinks of the east. The females, meanwhile, are preparing the grass-lined, sunken nests under protection or in the open. Here four or five light blue eggs are incubated, the old birds blending so well with the surface of the ground that they are not easy to find. While raising the family, these birds are shy; at other times they are friendly, especially on migration and in their winter home on the southwestern prairies. They are beneficial in the destruction of injurious insects, especially grasshoppers, leaf beetles and weevils, which constitute more than seventy-five per cent of their total food. They add to this the seeds of noxious weeds.

LARK BUNTING—*Calamospiza melanocorys*

meadow-lark was chosen. In another campaign sponsored by the *Denver Post,* in cooperation with the Colorado Mountain Club and the Colorado Federation of Women's Clubs, the mountain bluebird received the most votes. Bills in favor of the bluebird and the lark bunting were introduced into the 1929 Legislature but died there. Headed by Roy M. Langdon of the Colorado Audubon Society, a drive was made for the lark bunting, it being urged that other States had already chosen the bluebird and the meadowlark. When the smoke of political battle rolled away the Governor had, on April 29, 1931, signed a bill officially installing the lark bunting.

In Delaware the Mockingbird made an unsuccessful run for State honors against the Cardinal, which was selected by a large majority of those voting in the campaign organized by Mrs. L. V. Atkins. Official approval will be sought at the next Legislature.

Sponsored by the Audubon Society of St. Petersburg, the vote for Florida's State bird was active and interesting although overwhelmingly for the Mockingbird. The other candidates varied from the tiny hummingbird to the grotesque pelican, while one boy's school went solid for the vulture, commonly called the buzzard, because they had been building airplanes and studying this bird

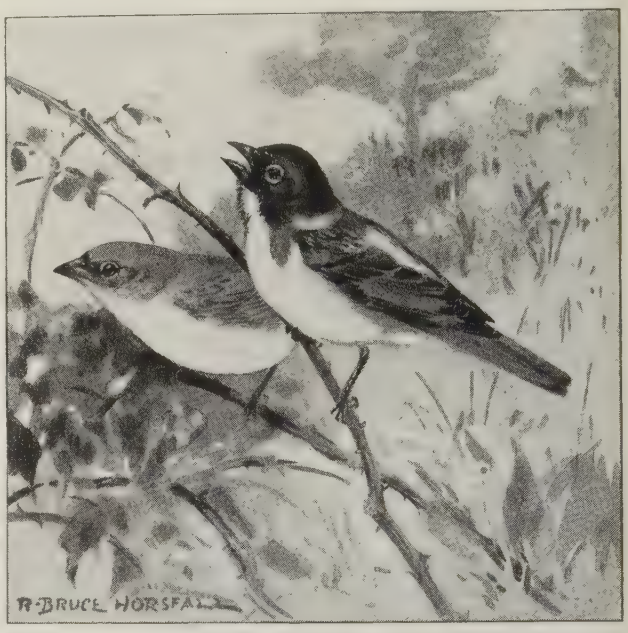
A SUGGESTED BIRD FOR INDIANA

The rose-breasted grosbeak would be an appropriate avian emblem

in the process. Senator John S. Taylor left his chair as President of that body to urge the official approval of the Mockingbird in which the House concurred. The measure was signed by the Governor on April 22, 1927.

Running safely ahead of the red-headed woodpecker and the purple martin, the Brown Thrasher was chosen by the school children of Georgia in 1928. The campaign was inaugurated by the Fifth District of the State Federation of Women's Clubs and was sponsored by the Atlanta Bird Club and kindred groups.

Interest in the campaign in Idaho ran high. As the State Federation Conservation Chairman, Mrs. E. H. Barton presented the western tanager as the choice of the women's clubs of the State. But the children overruled her and in the balloting the Mountain Bluebird, meadowlark and robin were favorites. The former lead the field and was generally endorsed, so Mrs. Barton fostered official approval by the Legislature and this became law in 1931.



WHAT TENNESSEE MIGHT CHOOSE

The painted bunting or nonpareil would make an appropriate state bird

In Illinois the State bird campaign developed the meadowlark, song sparrow, wren and the bobwhite as favorites, together with the catbird. Mrs. J. D. MaKinney of the State Federation sponsored a bill for the catbird, which, for some reason, emerged as a bill for the Cardinal, which was legally approved on June 4, 1929.

Back in 1924, under the leadership of Miss Madeleine Aaron, secretary of the Audubon Society of Kansas, a campaign was launched for selection of a State bird. Widespread publicity was given and a large vote was gotten out, giving the Western Meadowlark a plurality of some 121,000 votes over the other candidates. The official election day was Kansas Day—January 29, 1925—and it marked the culmination of a remarkably successful educational campaign. Kansas has not as yet, however, officially recognized the selection by Legislative action.

James Lane Allen made the Cardinal the favored bird of Kentucky in his famous book of that name, and it was both natural and inevitable that it be established as the official State bird. The 1926 session of the Legislature passed such a resolution, which was approved February 17, 1926.

The Pelican was established as Louisiana's State bird through the medium of the State Seal, which was formally designated in 1902 by the then Governor Heard.

Maine's legislators officially approved the Chickadee as the State bird in 1927 after a campaign conducted by the State Federation of Women's Clubs with the leadership of Mrs. Carl E. Kelley. Clubs, Schools and the State Grange joined in the balloting.

It may be said that Maryland was presented with a

state bird nearly a century and a half before it became a state. It is related that when George Calvert, the first Lord Baltimore, founder of a colony on Newfoundland, became wearied by the severity of the climate and by persecution, he went to northern Virginia (now Maryland) where he was granted a large tract of land. Here he selected as the colors for his coat of arms the orange and black of a beautiful bird that he found common among the trees. A century later Catesby, in the account of his famous travels in Virginia and Carolina, called this the Baltimore bird, and from his description the great naturalist Linnaeus formally described the bird in 1758. Ever since that time the Baltimore Oriole has been Maryland's state bird.

From October, 1928, to May, 1929, the State Audubon Society of Michigan conducted a systematic campaign with the cooperation of the press, libraries, schools and many groups. A total of 184,209 votes were cast, the Robin leading with a vote of 45,541. The chickadee received 37,155 and the bluebird 17,024. There were many other candidates. The choice was legalized on April 8, 1931.

Minnesota was faced with an embarrassment of excellent candidates in its State bird vote organized by Mrs. Willard Bayliss, then president of the State Federation of Women's Clubs. After much publicity and a substantial vote for the Goldfinch, it was selected.

Debates in the schools, special club programs and publicity attended Mississippi's State bird campaign conducted by Mrs. G. H. Reever, chairman, which was made the outstanding work of the conservation division of the State Federation in 1929. The Mockingbird proved to be the popular choice and it is expected that it will soon be given legal status.

"With the bluebirds protesting from the trees on the capitol lawn outside his window, Governor Erickson today approved an act of the last legislature making the western meadowlark the State Bird of Montana," says a newspaper dispatch from Helena on March 14, 1931. This came as the result of a rousing State campaign led by Mrs. I. D. Hadzor, then conservation chairman of the State Federation. The robin, tree swallow and goldfinch were also active candidates.

Twenty-seven candidates contested in Nebraska in the campaign submitted to the schools by Mrs. Elizabeth Hoefer, State chairman of conservation, after the State Federation had approved such a drive. The Meadowlark was successful and was officially recognized on March 22, 1929. The bird appears in the decorations of Nebraska's new State Capitol.

Nevada citizens and school children had little difficulty in arriving at a choice of a State bird, the Mountain Bluebird leading the field in an extended vote during 1930 and 1931. This bird was the nominee of the club women of the State.

The New Hampshire Federation of Women's Clubs, through Mrs. Lucy F. Richardson, then chairman of conservation, sponsored a vote in 1927 that returned the Purple Finch as victor in the State Bird ballot.

Dividing the State into districts, New Mexico was thoroughly canvassed for its opinion on a State bird and the Road-Runner led all the rest. In fact the vote for this typical bird was just about unanimous. Mrs. Tom Charles, president, reported the choice.

An old campaign for State bird of New York having selected the robin and let the matter drop there, a new campaign was launched in 1927-28 under Mrs. Charles Cyrus Marshall. Although the robin was included as a nominee he ran well behind the Bluebird, which now is regarded as the State bird.

Through the circulation of leaflets describing the three most useful birds not then selected for State bird honors elsewhere, Mrs. I. T. Frary, chairman of wild life for the State Federation of Ohio conducted an effective campaign in 1928. Ballots were included and the vote gave the House Wren a lead of 7,469 votes over its nearest rival.

More than 69,000 votes were cast in Oklahoma's campaign for a State bird under the leadership of Mrs. W. A. Campbell and Mrs. Ellen Howard Miller, and the Bob-white triumphed by a wide margin. Much stress was placed on conservation in this program.

In 1926 the Oregon Audubon Society asked for a vote for State bird and got more than 45,000 votes for the Western Meadowlark out of 85,000 cast. The Governor proclaimed the choice July 18, 1927.

The Ruffed Grouse was legalized as the State bird of Pennsylvania by the Legislature of 1931 after a long campaign and deliberate voting. Mrs. Harry J. Shoemaker, Chairman of birds and flowers, and the officers of the State Federation of Women's Clubs as a whole urged the selection.

Schools, clubs, granges, scout troops and other organizations joined in voting for the Bob-white as Rhode Island's State bird. The other candidates were osprey, flicker, tree swallow, song sparrow and catbird. A distinguished committee of tellers officiated.

The campaign in South Carolina was under the leadership of Miss Claudia Phelps and in 1930 the Carolina Wren won honors over the Carolina dove.

Various organizations joined with the State Federation of Women's Clubs in Texas in selecting a State bird. More than 100,000 children added their ballots and the victor was the Western Mockingbird, which was officially recognized in February, 1927.

Utah's State bird is the Sea Gull in grateful remembrance of the gulls that delivered the crops of the farmers from the pest of the insects in 1848, and a monument to the birds stands on Temple Block in the park of the Mormon Tabernacle.

In Vermont the State Federation of Women's Clubs conducted a campaign in 1927, the Hermit Thrush emerging victorious. In Virginia the late Miss Katharine Stuart drew together bird lovers and conservationists in an educational campaign that made the Robin State bird by popular vote. The robin ran way ahead in the vote taken in Wisconsin under the leadership of Mrs. Walter Bowman, who conducted the campaign as conservation chairman in 1926. Mrs. Edward Ewel of Wyoming was one of the first to respond to the call for a State bird campaign, and by 1926 the Western Meadowlark was established as the favorite; it was legalized in 1927.

There remain only five states that have as yet not joined in the selection of a State bird. These are Connecticut, Indiana, Iowa, New Jersey, and Tennessee.

THE AMERICAN, OR BALD, EAGLE

MICE THAT WALTZ

BY H. E. STEBBINS

When Mr. Stebbins wrote asking some advice about the interesting little pets he is breeding for sale we found ourselves rather blissfully ignorant about these waltzing mice. But we were interested in hearing about them and thought our readers might be, also. So we asked Mr. Stebbins to tell about them and here is the story.

ON ITS WAY THROUGH THE PLAYHOUSE

So active are these little Japanese waltzing mice that they tax the photographer to get a picture of them

IT TAKES long and arduous training and study to make a ballet dancer, or any other dancer of professional calibre. For my part, after many attempts, I despaired of ever becoming an accomplished partner in the waltz. And so I confess that I look with some envy upon the gyrations of my little Japanese waltzing mice who prove to be born dancers without benefit of the Blue Danube or other musical inspiration to terpsichore.

Now, of course, it is not quite accurate to say that these beautiful little creatures "waltz". They do not stand up on their hind legs and hold hands or put their forelegs about their partner. But, just the same, the word waltz is as good as any other for the twirling, prancing and circling antics of these little fellows, whose greatest delight seems to be dancing through a sort of playhouse put in their cage.

In the past year, while I have been breeding and experimenting with these fascinating little pets, I have counted as many as two hundred and fifty complete revolutions made without pause by one little adult. And they will circle about an object an equal number of times without stopping to rest, or, seemingly, losing their sense of equilibrium. Nature certainly has endowed these creatures with peculiar, fascinating and outstanding characteristics.

To answer the question of why these mice behave like spinning tops, anatomists and physiologists have advanced various theories. As far as can be determined they appear to have originated in China or Japan and to be the result of a process of selective breeding. At least we know that, aside from being deaf and having the dance habit, they are normal and attractive little pets for anyone.

A full grown adult waltzing mouse is smaller than the ordinary mouse of the pantry and the common white or albino mouse. They are beautifully marked in black and white, and are dainty and cleanly. The markings vary widely, giving them individuality that the white mouse cannot claim, and in this way one is able to recognize one from the other in a group. Although I have loved and, from childhood, have bred a variety of small animal pets, I do not believe that any have given me so much enjoyment for so little trouble.

A small box for a cage, a nest to sleep in and a playhouse are the only things necessary to keep a pair of these little fellows happy. For two or three of them a wooden box about sixteen inches square with ordinary window screen on the top and one side fills the bill admirably as a cage. The floor of this I cover lightly with sawdust or fine sand, preferably the sawdust. For a nesting box I provide them with a box about four inches square filled with some soft material such as tissue paper. Cotton does not seem to work because they get tangled up in it easily.

Life for the mice seems to be made much more enjoyable if they are given a playhouse. This may be made from an ordinary cigar box or other light wood. A box three or four inches square with a top but no bottom, and with a semicircular archway in each of the four sides, the box inverted in the cage, satisfies the need. The little creatures will play for hours, dashing in and out of the openings at a pace that is so fast and furious that at times one mouse can easily be mistaken for two or three.

The care of the mice is not complicated. They should

BIRD'S-EYE VIEW OF A BATCH OF YOUNG WALTZERS

With their beautiful and varied black and white markings, they make distinctive little pets

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be kept away from drafts. For food they like dry food such as white bread, rolled oats, cereals, canary seed and other small grains. Once or twice a week some green food such as a bit of cabbage, carrot or turnip may be added to their fare. When available a few dandelion leaves or clover tops are relished. A small piece of bread moistened with sweet milk is good for a change, especially for a mother with youngsters. Fresh water every day, placed in a shallow dish, is necessary, probably due to their great activity.

Since mice are nocturnal in habit, these fellows run true to form and are busiest in the late afternoon and evening, although they seem to be in and out of the nest at all times of day. Usually four or five babies are born in each litter, although as many as seven, eight or even nine are not unusual. They grow rapidly and are out of the nest in about fifteen days but should be left with the mother for a month. They mature in about three months.

So these little waltzing mice, with this simple care and equally simple home, can become pets of continual fascination, and not many people, as yet, know of them.

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THE LARGER WHITE TRILLIUM

MOST BEAUTIFUL OF ITS FAMILY

BY LOUISE RAVENS

DENIZEN OF DAMP PLACES

The shade-loving larger white trillium is a favorite of spring

OF THE many varieties of trilliums, perhaps none is more beautiful than the larger white *Trillium grandiflorum*. To those who know it well, no spring seems complete without at least a fleeting glimpse of this splendid flower. Like most of its sisters, it loves the deep, moist woods. Here it reaches its greatest perfection with three luscious petals of purest, translucent white emerging from the green calyx, and with the stamens forming a heart of yellow gold.

In some of our midwestern states this trillium may yet be found growing in profusion, but even in our forest preserves, vandalism and carelessness are fast bringing its extinction. Its manner of growth makes it impossible to pick the flower without taking also the three green leaves, which are the lungs of the plant. Therefore, to pick a trillium is practically to commit an act of murder in the plant-world.

With reasonable care, *grandiflorum* may be successfully cultivated in shady gardens, and it will amply repay any attention bestowed upon it. Rich leaf-mold and an abundance of water are necessary for its finest development and it should be well protected from the sun's hottest rays.

TREE FRUITS OF THE WOODLAND

BY MARY F. ROBINSON

PHOTOGRAPHS BY
CHARLES W. ROBINSON

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GRAY BIRCH
These fruiting catkins are more nearly cylindrical than those of the other birches

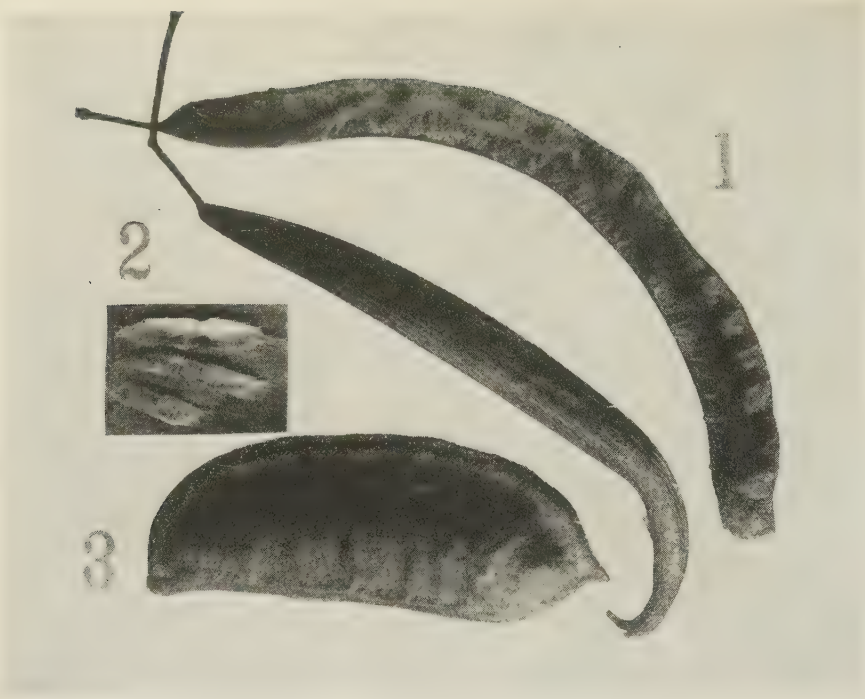
FRUITS of our common forest trees, though sometimes as inconspicuous and nearly as fleeting as the flowers that produced them, offer such ingenious contrivances for our admiration that they rival them, not in exquisite delicacy of parts, but in intricate structure, variety of forms, interest, and in charm. They are well worth our study.

The outer covering of the fruit, which gives the characteristic shape and is never showy in color, is for protection and is also designed so that it will carry the fruit to favorable germinating spots. Within is the vital part, the baby plant, or the seed carefully protected in turn by its own covering. The seed, we know, is always the result of the combination of the pollen from the staminate flower with the ovule of the pistil within the pistillate flower. But we cannot always trace the origin of the outside covering because, depending upon the species, different parts of the flower develop to form it. Sometimes parts of the flower are wholly suppressed and sometimes are united in its development, making the study of the fruit rather more perplexing than that of any other organ of the plant.

The finding of the fruit is often a helpful complementary asset in identifying trees. There is such a wide variation in form and appendages, such pronounced individuality that it is easy to distinguish a maple key from an elm samara or an ash paddle, although all three have wings; an acorn from the fruit of the hickory though they are both nuts, or a flattened, dark reddish honey locust pod, spirally curved to be caught and rolled by the wind, from the long, spike-like pod of the catalpa packed to utmost capacity in a most orderly fashion with thin, gray, oblong fruits fringed at the ends. The fruit alone, however, cannot be depended upon as a means of identification. Trees are often permanently or temporarily barren. Those like the ashes, some maples, and the poplars, which produce staminate and pistillate flowers on separate trees will, of course, produce fruit only on the tree bearing pistillate flowers. Some trees, as the beech, may grow to good size and still be too young to bear fruit, and, again, some species of trees do not bear every year.

SWEET BIRCH CATKINS
The ripe fruiting cones shake out shiny brown seeds that resemble insects on the wing because of two gauzy wings and antenna-like styles

The purpose of the tree is to have its seeds conveyed by wind or gravity to spots some distance away where they may find air, and sunshine, and homes in new soil rich in the elements needed for their growth. By far the most of the forest tree fruits, whether the seeds are comparatively heavy like those of the ash, or very light like those of the elm, are furnished with wings of various forms and are wafted away in whichever direction the wind may blow each in its own time, that all may have an equal chance. A small percentage of fruits or seeds that are adapted to wind dispersal are encircled with soft hairs like the poplar seed, or tufted with fine hairs at one end like those of the willows, or with coarser ones like the sycamore fruits, to make them fly fast and far. The hop hornbeam produces its seeds within inflated, bag-like structures, a number of which grow together in a drooping cluster, to sail away light as balloons upon the September winds. Wherever we find spines on the outer covering of a tree fruit, as in the beechnut, it is for protection, as a rule, rather than for dispersal. The wind is the chief agent in the scattering of these fruits, and the winged seed or fruit characterizes the great forest tree. Those that are too heavy to be buoyed up and carried out from the tree by the wind are so constructed or so shaped that when they fall they will either bounce or roll into new homes. Some of these are so attractive to the animals of the woods that in sheltered nooks on flat-topped rocks we find the remnants of many a feast. Nature did not intend that nuts and acorns should be dispersed by animals, but many of these, carefully tucked away beneath the soft leaf



THREE LARGE TREE FRUITS, HERE ABOUT HALF SIZE

The pods of the honey locust (1) and the Kentucky coffee tree (3) contain bean-like seeds, but the pod of the catalpa (2) is filled with winged seeds

mold by small animals for future use, are forgotten, and thus, by accident, have reached favorable homes.

Most of the fruits of the common hardwoods ripen in late summer or autumn, but it is quite important to know approximately when the early fruits mature. Those of the elms are often ripe and swept away by the wind before the trees are fully leaved out in April. The silver and red maples scatter their seeds in May and June, six weeks after the flowers open, that their seeds may find warm, moist places in which to germinate quickly and develop sufficiently during the warm season to withstand the rigors of winter. For the same reason other trees that love to grow in the swamps, by the river's edge, or by the brook that winds through the meadow, such as the river birch, the poplars, and the willows, hasten to ripen and send forth their offspring to seek new homes. The fruits of the willows develop from their drooping pistillate catkins into little, green pods or capsules along the catkin axis in about four weeks. In eight weeks the poplars go through the same process. The poplar capsules are larger than those of the willow and often curve outward from the central axis. In the last week of May I have found the big-toothed aspen catkins open, the two valves of the capsule rolled back, and, clinging to the withered catkin, the bunches of hairs containing the minute seeds almost invisible to the naked eye.

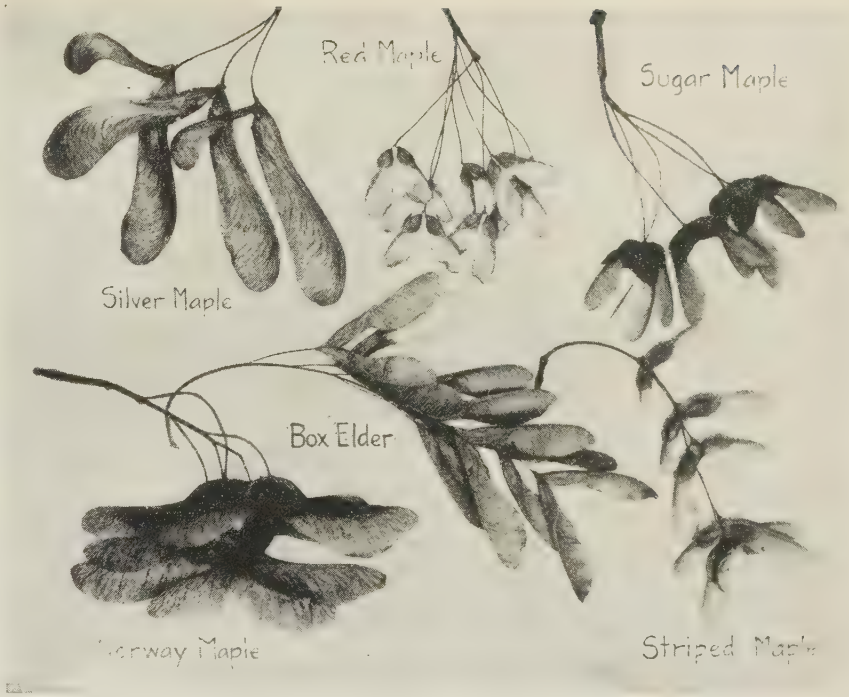
Unlike the poplars the fruiting catkins of the birches are stiff and usually sit erect upon the stem, resembling little cones. They consist of alternating layers around the central axis of quaint, three-lobed scales and dainty, two-winged, little brown seeds more easily studied with the magnifier. Each kind of birch seed has a pair of styles attached to the end of the seed between the shoulders of its gauzy wings; those of the sweet birch are most prominent and easily seen. When the fruits are ripe and the catkins fall apart these light, insect-like seeds are wafted far and near. No two kinds of birch seeds are winged just alike; each three-lobed protecting scale has its own characteristic shape, the gray birch resembling the outline of a bird on the wing. The yellow birch catkins are the thickest, those of the gray birch are more nearly cylindrical and stay on the trees longest, the river birches have the largest seeds inside and are the only ones with downy, margined wings.

DO YOU RECOGNIZE THESE FRUITS OF THE TREES?

The husks of the sweetest hickories, mockernut (1), shagbark (2), and the kingnut (3), are the thickest. The thin-husked hickories, pignut (4) and bitternut (5), are not desirable food

Just why Nature tucks the winged birch fruits under the

protecting scales of a charming little cone and lets the delicate, winged fruits of the elm hang in clusters exposed to the elements we do not know. The white elm and the English are the most prolific. In one cluster taken from an American elm I have counted two dozen fruits that have developed from the flowers coming from one bud. The whole fruit, about three-eighths of an inch long, attached to a short, slender stem, is flat, and consists of a thin wing, nearly elliptical in outline, with a circular notch in the outer end, and a central sac-like portion containing a tiny seed which can be seen when the fruit is held to the light. The margin of the wing is thickly fringed with fine, white hairs. The English elm fruits are two-thirds again as large, almost circular, with a much larger proportion of thin, gauzy wing and a less evident slit-like notch; the small hollow central part contains a smaller seed. No hairs can be seen even with a magnifier. The slippery elm fruits come between these two in size. They have no noticeable notch in the gauzy wing, and have hairs only in the hollow part that holds the seed. Those of the rock elm are thicker in texture and are entirely covered with soft white hairs.

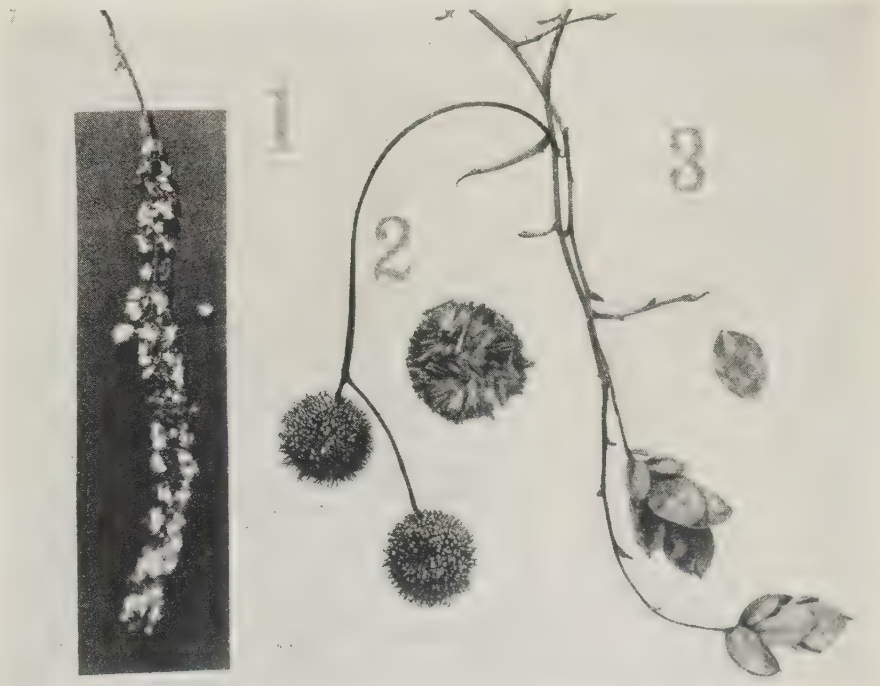


SOME INTERESTING CONTRASTS IN THE MAPLES

The arrangement of the maple fruits in their clusters varies with the habit of growth of their stems. No two kinds of maple keys are just alike in size, outline or position of wing

The spatula or paddle-shaped winged fruit of the ash, with the seed at one end of the paddle, is distinctive. The white ash paddles grow on diverging stalks, dividing by threes, making the group sometimes from five to seven inches long. They are abundant and very noticeable even when green like the leaves. The cylindrical, oat-like seed at the top of the paddle is prominent and tapers to a point within the flat wing. The fruit of the white ash may mature in August, that of the black ash perhaps not before October, but all kinds may hang on the trees after the leaves are gone.

The most interesting and perhaps most easily found of all the winged fruits are the paired samaras or keys of the maples. Each kind has two seeds protected by veined, thin coverings that expand into appendages shaped somewhat like the wings of a dragon fly. These wings sometimes hang below the seeds as in the sugar maple keys or the sycamore maple. They diverge at varying angles in all the other kinds, slightly in the red maple, and most widely in the Norway maple keys. Three kinds, the red, silver and sugar maple fruits, grow in bunches with stems all the same length, while the box elder, sycamore, and striped maple keys hang in drooping clusters

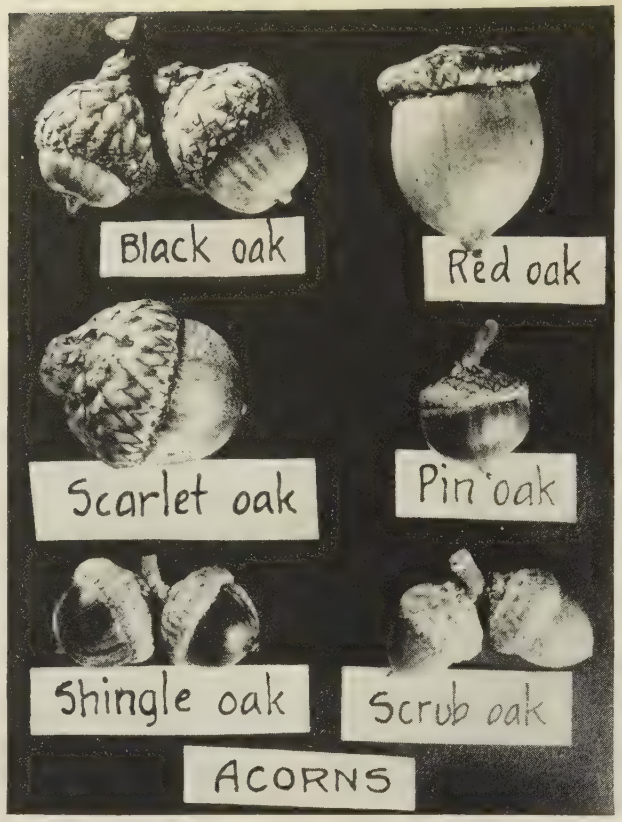


SHOWING HOW THE FRUITS OF TREES VARY

Big-toothed aspen capsules (1) hold tiny cottony seeds; sycamore balls (2) consist of slender hairy nutlets; and fruit clusters of hop hornbeam (3) are made up of downy balloon-like seed-carriers

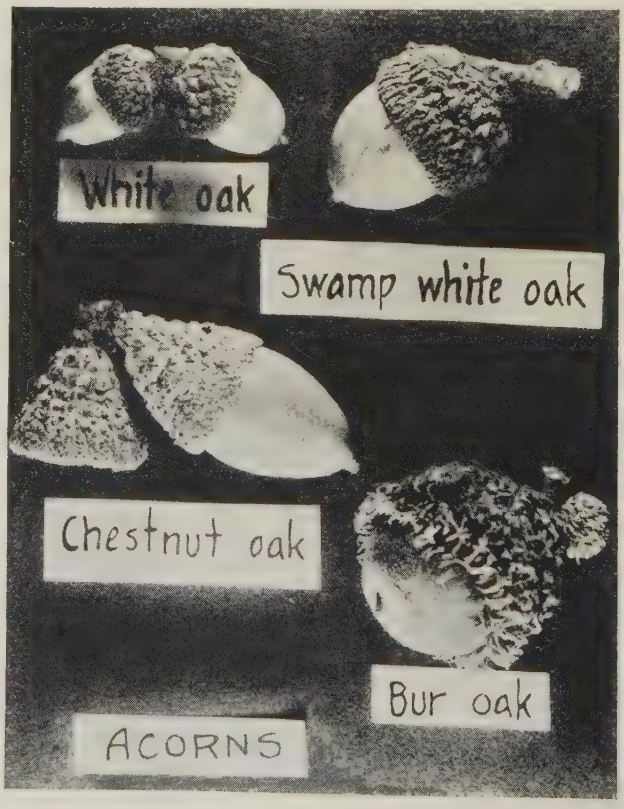
or racemes. The keys of the Norway maple grow from stems of varying lengths which curve gracefully downward. The silver maples ripen their fruits earliest, and their keys hold the largest of the maple seeds. The keys of the red maples are the daintiest in form and color and most delicate in texture. I have seen red maples in the woods loaded with keys a light, soft, waxy brown, and others near by with an abundant harvest of these fruits light brown in the seed pocket portion but beautifully shaded with red in the thin part of the wing. After they fall they soon disappear from the ground.

"When the yellow woods let fall the ripened mast" is the time to gather fruits of the oaks, the hickories, and the butternuts. The familiar fruit of the oak, which sits in its unique little cup furnishes as many different distinguishing points in nut and cup as there are kinds of oaks that produce them. There are just two common ones that have very shallow, saucer-like cups, the big red oak acorn and the smaller, beet-shaped pin oak acorn. Both belong in the black oak group. All acorns of this group have broad, thin, pointed cup scales, and because they do not ripen until the second autumn after they form, Nature has provided them with protective, woolly coverings which are just inside the thin shell of the nut. Scarlet and black oak acorns are satiny and hairy and their cups are often similar in shape, but in those of the black oak the points of the cup scales near the nut stand away from their bases and



ABOVE, THE BLACK OAKS; BELOW, THE WHITE

The cups of the acorns of the black oak group are made up of thin, pointed scales arranged in orderly fashion and are neater in appearance than those of the white oaks, but the nuts of the white oak group acorns are smoother and cleaner looking and lighter in color. Study these pictures and in your next wanderings outdoors see whether you can tell which oak is which just by the looks of the acorns you find on the ground



the nut, while those of the scarlet oak are all so tightly pressed together that the outer row touches the nut. The acorns of the black oak group are much easier to find for they are produced in greater abundance and are too bitter to be pleasing to the taste of animals. The common acorns of the white oak group are smoother, lighter brown without any markings, and none of them have the woolly covering beneath the thin shell. Their cup scales are more or less thickened so that the cup has a fine pebbly appearance. The white oaks ripen their fruit annually but do not bear well every year. Their acorns are sweet.

The hickories and butternuts intend their fruits to bounce and roll to new homes, for both have fibrous fleshy, outer coverings and are rounded in shape. The hickories have outside their own shell husks that split either all or part of the way from top to bottom. Those hickories whose nuts are sweetest, the shagbark, kingnut, and mockernut, seem to realize their disadvantage and have thickened their husks for protection. Unfortunately squirrels' teeth in sharpness and in length have kept pace with the thickening of these outer coverings and most of these nuts are destined to become food. The thin-husked, small hickories, the hard pignut and bitter tasting bitternut, are usually left strictly alone under their trees. Butternuts, which grow singly or in groups of from two to five near the ends of stout twigs, are very conspicuous in outline against the blue October

sky, when the yellow leaves of the tree are almost gone. When you gather them after a high wind from under the tree, their sticky, dark green, hairy jackets blacken the fingers. Unlike the hickories the outer leathery coverings of the butternuts do not split.

IMMATURE BUTTERNUT FRUITS
When ripe they have the same outward appearance and are easily recognized by their leathery dark green coverings, which are both hairy and sticky

Although we cannot all do as did Thoreau, who sat for days and watched the fuzzy seeds of the willow wafted on the gentle breeze, collect and germinate on the scum, and grow into seedlings in the river's mud when the freshet went down, we can derive much enjoyment from patient observation on our rambles and learn for ourselves interesting facts not easily obtained from books. We may discover why some fruits will not germinate until two years have elapsed, why some must freeze before they sprout, why some germinate with the outer covering on, and others cast it off, why some have better means for reaching homes away from the vicinity of the mother tree where the soil may be partially exhausted, and why some trees produce fruits alike in structure but different in germinating habits, so that portions of any one crop sprout at intervals of one, two, and three years after dispersal. We may be sure that Nature knows best and has wisely provided in the way she has, that some at least of these seed babies may find favorable conditions in which to live and grow to maturity that they may in turn carry on the work of distribution of their kind.

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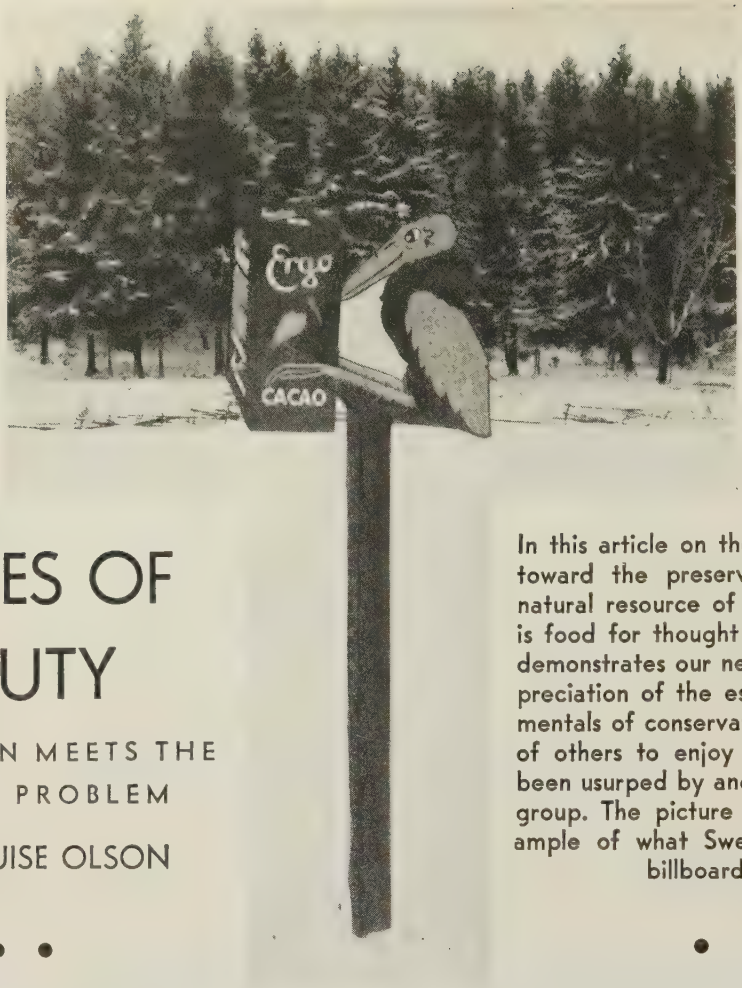
THE WHITE-CROWNED SPARROW BY EDWARD A. PREBLE

BIRD of the far North and of the mountains, whose white, puffy crest is one of Nature's signs that winter is gone and summer is coming. Far to the South has he been, for he is of tenderer mold than some of his fellows, and can not bear Keewadin's icy blasts. Yet absence has not lessened his love for his birth-land, and as winter retreats he follows closely northward.

The Cree Indians, whose love of Nature, aided by their soft-toned language, finds expression in many poetic phrases, translate his song as *Wah-sipis-chan-tillee-tillee*—little river murmuring tillee-tillee. In their hinterland, and farther North, this welcome summer visitor shares with our own chipping sparrow its familiar place, for he builds his nest in the grassy clearings, sometimes in the very door-yards of the trading-posts and native villages, and sings through all the daylight and twilight hours the strain of the "little river." So from Athabaska Lake, the Lake of the Hills, north to the last of the dwarfed spruces that mark the beginning of the Arctic, this little songster lends his cheer to the darkless summer.

On the ground the white-crown builds his grass-cupped nest, hiding it so cunningly at the base of a grass-tuft, and using such artifice in his goings and comings, that the brood is usually raised in safety, even on ground covered daily by bands of ravenous dogs, whose never-ending search for food leaves few such morsels overlooked.

On the slopes of our western mountains also dwell numbers of the same cheerful race, finding on these elevations conditions of climate as pleasing as those enjoyed by their cousins of the North, and differing from them neither in color nor in song. Truly does our white-crown cheer many a forest camp.



PIRATES OF BEAUTY

HOW SWEDEN MEETS THE ROADSIDE PROBLEM

BY ALMA LUISE OLSON

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In this article on the attitude in Sweden toward the preservation of that great natural resource of natural beauty there is food for thought for us Americans. It demonstrates our need for a national appreciation of the esthetic, of the fundamentals of conservation and of the rights of others to enjoy beauty that has not been usurped by and for a small parasitic group. The picture at the left is an example of what Sweden regards as the billboard menace.

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Love of beauty in Nature is so pronounced in Sweden that it has practically become a "sixth sense" of the nation. In Swedish literature the dominating note for many decades has been lyrical verse with its emphasis on the moods of joy or melancholy inspired by idyllic scenery. In painting, a Bruno Liljefors, artist of the wild life of the North, transfuses the horizon of some wooded scene with the mystic, luminous glow of the long, white summer night. In music, a Hugo Alfvén converts the very sound itself into light through a progression of chords in a central movement of his rhapsody, "Midsummer Wake." Thus do Swedish artists interpret beauty.

Parallel with this highly developed regard for beauty in Nature runs a keen sense of protection of such beauty. The public consciousness is easily aroused if any desecration is threatened. Since the beginning of this century the chief source of danger has been the commercial interests with their flaunting of billboard and other outdoor advertising. And the main point of attack has naturally been Stockholm, the capital, and its surroundings. First these signs began to appear along the railway lines and waterways leading into the Swedish capital. But as motor transportation increased the burden was shifted largely to the land highways. Almost at once, however, began the counter-attacks on these pirates of beauty.

SWEDISH RAILWAYS BAN BILLBOARDS

No advertising signs are permitted on or around the station. Instead trees, grass and flowers are provided to adorn them

Some seven hundred years ago the very waterways and roads in this region were infested with actual pirates coming up from across the Baltic to plunder and prey upon the wealth of the old capital, Sigtuna, and after it was ravaged the fortress town of Stockholm was built a little farther south as a means of protection to the country. Just as

THIS IS REGARDED AS A BAD SIGN

Opposed as dangerous on a curve and injurious to the scenery, we envy Sweden this sign as compared with the many immense panels at curves, intersections and underpasses in the United States

Stockholm in its earliest rôle helped to ward off the thirteenth-century pirates, so today this progressive Swedish capital is in the vanguard in trying to rid the State of the threat of an invading band of billboards, easily recognized also as pirates despite their modern guise.

Some decisive steps have been taken by legislation. A law of 1909 has provided that for regions that are of special interest because of unusual scenic value or of great beauty it is permitted to prohibit billboard or other similar advertising except on a building used as a dwelling or for business purposes. The Swedish Society for Protection of Nature has been actively concerned in seeing that this law has been enforced. Some years ago it went further in requesting that along all the waterways and highways leading into Stockholm large billboard and other display advertising should be prohibited. Enforcement was possible since these regions were so obviously of great scenic beauty.

There has been some difficulty in interpreting the actual wording of the original law in less pronounced instances. Just what determines whether scenery can be called unusual or remarkable? A few years ago when Finland set about to formulate an effective law, it profited by this obscurity and eliminated all doubt. The new Finnish law now prohibits all display advertising (except on buildings) outside towns and cities and other populated communities. Apparently it is only a matter of time until Sweden also will arrive at this goal. In 1931 the Swedish Society petitioned the Riksdag to effect a change in the wording of the law. According to the proposed new wording, billboard and other outdoor display advertising will be eliminated entirely (except on buildings) in country districts and limited to cities and other populous centers.

A few minor exceptions have been indicated. Special concessions should be granted gardeners or nurserymen who have plants to sell and do not have a building near a roadside on which the proper announcement can be displayed. Exceptions in certain cases should also be made for lots advertised for sale, especially in some "own your own home" development, and for those who sell coffee or food in café or restaurant not visible from the road. In any of these instances the local authorities might find it practical to permit display advertising of a suitable type.

All these suggested prohibitions have been prompted by esthetic considerations. As this request was laid before the Riksdag, there were accompanying photographs to show how billboards at present are permitted to disfigure the Swedish landscape. Compared with what one finds in many sections in America, these offences may seem rather petty. But it is just because the billboards are less common that they become all the more insidious when they do put in their appearance. While it was Stockholm, with surroundings, that had taken the lead,

IS THIS WORTH PROTECTING?

America can easily match the charm of this countryside but does not appear to consider it worth protecting

other communities are now pursuing the same course. Gothenburg, Sweden's largest commercial port and its western gateway, has begun an active campaign against billboards, and in the central province of Dalecarlia similar steps have been taken by certain centers where tourist traffic in summer is the heaviest.

Some years ago an added impetus to the good work came from an unexpected source. The Royal Automobile Club of Sweden came out vigorously in support of restricting outdoor advertising from considerations of safety. An old roadside law has prohibited the erection of display advertising within a distance of 3.5 meters from the highway, a prohibition that has met with opposition from beauty lovers since they say that it only forces the advertising signs farther back into the regions which should be left undisturbed. In other words, if they are to appear at all, the logical place in esthetic considerations is near the highway, which of necessity has already become commercialized. With this and other objections in mind, the Royal Automobile Club (K A K is the familiar group of letters by which it is identified in Swedish) took a stand that favored a complete curbing of a practice that was having insidious effects.

The arguments on the grounds of safety are well known and are no different in Sweden than in other countries. It is inevitable that the attention of the driver of a motor car must be diverted away from the road if there are numerous advertising signs along the way. Self-operating illuminated signs are especially fatal. With increasing motor traffic it becomes imperative that the signs put up for the guidance of the motorist—actual traffic signs and signals—must be given the right of way.

THE OBJECT OF OPPOSITION

Another sign that the Swedish Society for Protection of Nature seeks to have removed through effective law

The arguments are too obvious and too universal to need further elucidation.

A third consideration is that of good will. Where esthetic and safety considerations are matters of interest specifically to the public at large, the question of good will affects directly the advertiser and the products he advertises. The motor interests themselves were the first to be affected. For in Sweden, as elsewhere, the bulk of the large roadside signs had some connection with motoring—signs indicating the site of a garage, a petrol station, a repair shop. When these became too abundant, they defeated their own purpose. To the Swedish K A K came repeated protests like this: Who cares to motor through beautiful countrysides when the very beauty of those countrysides has been destroyed by the motor interests themselves?

But there was also general advertising of merchandise. Appeals to such organizations as the Swedish Merchants' Association, the Swedish Publicity and Advertising Association, and individual transport associations evoked varied replies. The advertising groups were perhaps the most reluctant to admit the evils. The merchants themselves recognized that without the good will of the public they were

CRADLE OF THE SWEDISH MATCH INDUSTRY

An industrial center but still its beauty is unmarred by ugly commercialization aspects

NURSERY OF THE STATE RAILWAYS

Here are raised the trees and flowers that are distributed to adorn the stations of the system

throwing away their money. They admitted that the same or better results could be obtained through newspaper and magazine advertising and displays within the precincts of towns and cities.

The Swedish State Railways recently set a good example. For several years billboard advertising had been permitted on the station grounds, and the space so let had brought in annually the sum of some thirty-five thousand kronor, a sum that had been set aside for welfare purposes. About a year ago the contract, which was held by one company, expired, and it was not renewed. For the future there will be no advertising, therefore, in the form of billboards on station property.

Instead, the space so used will be absorbed in the general plan of beautifying railroad property. In the summer time the Swedish railway stations are oases of green grass and shrubbery and vivid, variegated flowers. As you draw near a station it may be a window-box of flowers or a row of hanging flower-baskets along the station front that first catches your eye. The grounds at the sides, a thick carpet of green, are as well kept as a row of lawns in a city suburb or progressive small town. The same care is expended on the surroundings of the linemen's cottages. Even in large cities like Stockholm or Gothenburg, the trains back up in the stations into a "railhead" consisting of an attractive clump of growing foliage or blooming verdure. At a station like Kiruna, several miles north of the Arctic Circle, the flowers in the station window-boxes seem to expand to double the usual size during the summer season when they absorb the double portion of sunlight that the midnight sun affords.

Billboard advertising has disappeared, and natural beauty will supplant it. What has been done by the State Railways, an institution that has the advantage in a situation like this because it is not operated for private gain, can be accomplished elsewhere with patient effort and time. And various organizations and local groups are actively engaged to effect the desired results.

It is not alone through sheer idealistic love of beauty that Sweden has been able to do so much in this advanced work of trying to eliminate displays that disfigure natural scenery. A small nation always has an advantage in a matter like this. The people have early been trained to conserve national resources. Toward the problem of conservation the public easily accepts its normal responsibility. "We who are a part of civilization are responsible to posterity for what may befall the fairness of the earth during our own lifetime," was the way William Morris aptly put it, but he was trying to stem the new tide of industrialism and, because of its force and magnitude, his own efforts in art had to become esoteric to be felt at all.

The Swedes have long been schooled to conserve Nature's gifts. The forests of Sweden are one example. The first attempts at forest conservation were begun more

IN AMERICA A FINE SPOT FOR BILLBOARDS

In Sweden the law protects the beauty spot and the safety of the motoring public of the nation

than a hundred years ago, and by modern scientific methods of reforestation the annual production by the forests themselves has been kept in excess of consumption, this, too, despite the fact that forest products comprise one of the chief sources of the industrial wealth.

Just this highly developed sense of responsibility to environment, attained by the slow process of training many generations, is the background of Swedish national life. It emerges as a positive force to buoy up the groups that try to effect some change such as the proposed important legislation in regard to billboard advertising. The only problematical factor is the length of time needed, since it is reasonably safe to predict that the outcome will be favorable to the groups trying to protect natural beauty. Any further increase in roadside advertising would mean, in surroundings like these, the rankest commercial exploitation. The billboards that exist have crept in like pirates descending upon a country at night, but public opinion in Sweden seems to be well agreed that they have no permanent place in its well-ordered life.

THE UPLAND PLOVER GIVES RISE TO A STRANGE TALE

THE BIRD WITH A CALL LIKE THE WHINNY OF A HORSE

THE "FLYING HORSE"

By W. L. McATEE

A MISSISSIPPI newspaper recently told its subscribers that "The flying horse is an odd creature with a long brown body about two feet long, its tail is bushy and hangs down like a horse's switch, with wings close to the body like a flying squirrel. Its head is shaped like an animal's and it carries its neck in a curve. The shrill cry of the flying horse is like the neigh of a yearling colt and its shrieks may be heard for a long distance."

A creature like that described would be more than odd; it would be miraculous. The story like most, however, outlandish as it may seem, has something at the bottom and in this case it is the cry of a bird. That bird is the so-called upland plover, one of the calls of which resembles the whinnying of a horse. Imaginative observers, as the news item reveals, have merely supplied what they have deemed appropriate details as to the appearance of a flying creature that makes a sound like a horse.

The bird in point is one of the wading or shore birds that has departed from the general habits of its tribe and taken to grasslands. There it was once abundant but hunting and encroachment upon its range have so reduced it in numbers that fear of its impending extermination is warranted. It is a beautiful and graceful as well as a useful inhabitant of upland pastures and prairies, but like so many other forms of wild life has been forced by man to give way.

In the days of its abundance several names were applied to it by hunters, as upland, field, or prairie plover, prairie pigeon, prairie snipe, and turkey plover. It was the "papabotte" of Louisiana epicures, and the wild mare, flying colt, or flying horse of those who were especially impressed by its peculiar cry.

This call as described by Elliott Coues is "a very loud, prolonged cry, sounding more like the whistling of the wind than a bird's voice; the wild sound, which is strangely mournful, is frequently heard in the night and is, I think, one of the most remarkable outcries I have ever heard." O. W. Knight, who worked on the birds of Maine, spoke of it as "a long, weird, mournful but mellow, rolling whistle like that of autumn wind," and E. H. Forbush in his grand work on the birds of Massachusetts, says "except for the wail of the wind, there is nothing else like it in Nature."

As we have seen, however, others think there is something else like it, and as we hear it some warm spring night, drifting down from a lonely bird, which though it may be in a flood of migrants, is yearning for its kind, has a quality seeming so strange for any aerial voyager, that we are not inclined to be severely critical of those who would call it, so truly imaginatively, the flying horse.

KING OF GEMS

APRIL'S DIAMOND IS MOST POPULAR OF ALL

BY AUGUST POHNDORF, JR.

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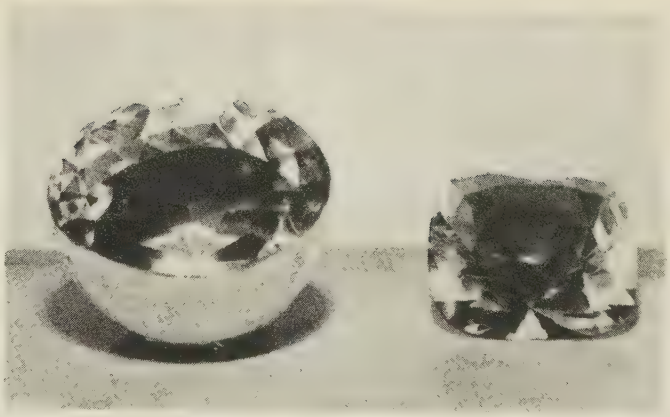


THE GREAT MOGUL AND THE KOH-I-NOOR
A photograph of glass replicas of these famous stones indicating relative size

THOSE born in April may rightfully boast that their stone, the diamond, is the most popular of all. Even in the days of Pliny, it was a prized possession: "The substance that possesses the greatest value, not only among the precious stones, but of all human possessions, is Adamas (diamond), a mineral which, for a long time, was known to kings only, and to very few of them." Not only because of its rarity and its hardness, but because it seems to gather unto itself the colors of all the other precious stones and to cast them forth in flashing, scintillating array it has long been ranked the king of jewels.

Great was its power, in the minds of men. The Greeks and Romans firmly believed that the "elements", fire and water, had no effect upon it, and named it Adamas, meaning "subduing." It was able to neutralize and overcome poisons, dispel deliriums and banish needless worry. It was a remedy for mania and it preserved virtue. Besides dissipating anger and strengthening love, it was an unfailing test for fidelity, because, it was said, a stone placed on the bosom of a sleeping loved one caused the heart to gush forth its most intimate secrets.

The diamond was believed for centuries to be too hard to break. If placed on an anvil and struck with a hammer, it shattered both implements without harm to itself. The only method for conquering it was recited by Pliny in his *Historia Naturalis:* "This indomitable power, in fact, which sets at naught the two most violent agents in Nature, fire, namely, and iron, is made to yield before the blood of a he-goat. The blood, however, must be no other than fresh and warm; the stone, too, must be well steeped in it, and then subjected to repeated blows; and even then, it is apt to break both anvils and hammers of iron, if they are not of the finest temper."

This idea, like many others of the Romans, was dispelled by scientific investigation. Although the hardest known stone, much harder, in fact, than the hardest sapphire, and given a 10 on Mohs' scale, it breaks quite easily, for parallel to each of its eight faces are planes where the molecular cohesion is decidedly less than elsewhere, and the stone tends to split, or cleave, along these planes. This property is largely responsible for the reasonable prices of diamonds, as otherwise the cost of cutting them would be enormously increased. And he who would try the anvil experiment with his wife's solitaire had better prepare receptacles for the diamond dust!

What is the diamond? Pure carbon. Carbon like that left on the bottom of sauce-pans, on the sides of lamp-chimneys, and in flues. Queer it is that this common substance, the Dr. Jekyll and Mr. Hyde of the mineral kingdom, appears so frequently as a messy nuisance, and so infrequently as a precious stone. Yet, after all, it is not so difficult to understand when one realizes that the carbon in a diamond has been crystallized under pressure so enormous that it would be found only infrequently near the earth's surface. Artificial diamonds have been made in specially prepared bombs releasing tremendous pressures, but not on a scale commercially successful.

The ideal stone is one that is colorless, flawless and possesses great brilliancy and "fire." Few diamonds have all four qualities. There may be color tints, lack of lustre, cracks or streaks or the inclusion of foreign matter. Some of the colored stones, however, are more valuable than those without color, especially flawless ones that have a strong ruby, sapphire, or emerald color.

No precious stone has played so important a rôle in history, fiction (particularly the detective fiction) and romance as the diamond. Murders, revolutions, suicides and political upheavals have revolved around it. The larger stones have been world famous, and probably more has been written about some of them than about many important human characters in history.

The largest diamond ever found, and the only one of huge size that did not come from India, is the Cullinan diamond, which weighed, in the rough, 3121 metric carats, or about one and one third pounds! It was named after Sir T. M. Cullinan,

Here is the fourth article in the interesting birthstone series, their history, tradition and composition written by an authority on gems. This series began in our January issue and will continue through the year. May will bring the story of the emerald, a stone of many fascinations.

chairman of the company that owned the Premier Mine in the Transvaal, in which it was discovered on January 25, 1905. The Transvaal Government purchased the stone for a figure close to a million dollars, and presented it to Edward VII of England on his birthday, November 9, 1907. The next year it was cut into a number of stones.

One of the most famous gems is the Orloff diamond, originally stolen from the eye of an idol in Mysore by a French soldier who sold it to the captain of an English ship for two thousand pounds. The captain received twelve thousand pounds for it from a London stone dealer, and later Prince Orloff of Russia purchased it for ninety thousand pounds and an annuity of four thousand pounds. He presented it to Catherine II of Russia and later it was placed in the end of the imperial sceptre. Where is it now? Who knows?

Probably the most valuable diamond is the Regent, or Pitt stone, which is in the Apollo Gallery of the Louvre. It is valued at nearly two and a half million dollars. The Great Mogul gem, which was 787½ carats uncut, and 240 carats cut, has been lost to sight since 1670. The second largest diamond, and the largest to remain in one piece, is the famous Excelsior, which weighed 995 carats rough. No stones have been more talked about, however, than the Hope Blue, 44½ carats, now the possession of Mrs. E. B. McLean of Washington, D. C., and the red Paul I, one of the Russian crown gems.

When you April-born slip your diamond on your hand, or wear your diamond brooch, you can reflect that your stone outranks any gem in the lapidary's catalogue, and had been acclaimed long before America was discovered, before Greece and Rome rose to power, when the centre of civilization lay along the banks of the Nile, and the rest of the world was a howling wilderness.

• • •

THE BLACK-CAPPED CHICKADEE

BY EDWARD A. PREBLE

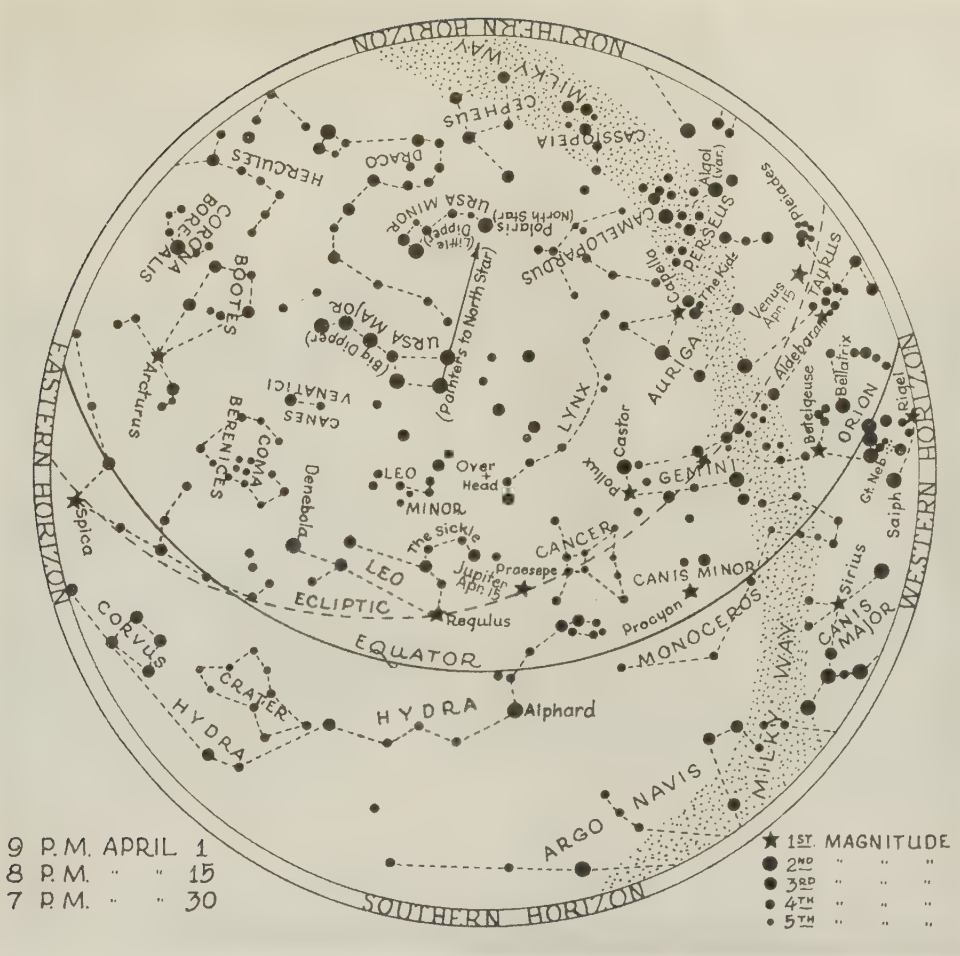
A FEATHERED wood-sprite, he of the sable crown and throat, with his bright black eye half hidden beneath his cap. Few there be who have not seen him somewhere east or west, between the temperate zone and the arctic. North of the trees he can not go, for all his life is passed in their service, and in ours. From dawn to dark he scarcely pauses in his search for insects, many of them so small that they are never seen by most of his feathered fellow-hunters.

In winter, when many of his fair-weather companions have gone to sunnier climes, Black-cap remains to guard his friends of the forest, and to cheer us with his sprightly call. Who ever heard of weather within the temperate zone too cold or disagreeable for a chickadee?

When spring comes around once more and the earlier of his wandering friends come back, Black-cap sings his love-song, and soon he and Mrs. Black-cap have picked out their home. In the dry limb of some orchard tree, or the top of a low white-barked birch stub their house is carved, for, like the woodpeckers, they are carpenters as well as hunters. In this snug cavity, hidden from summer storms, is woven the warmest nest ever made by bird. Finest shreds of moss, the fur of wood-rabbit, and the orange-down from cinnamon fern—of these the deep-cupped bed is felted. Here are entrusted the tiny eggs, faint-tinged with pink, and many-specked, six or seven, even eight or nine, so that one wonders how two small birds may hope to feed so many hungry mouths. When mother Black-cap leaves her treasures she covers them deep with a downy blanket, that any chance unwelcome visitor may not see them.

But one family, even a large one, is not enough for Black-cap, so while his mate broods her nestful, he improves his time by digging another home near by. Then when the first flock is self-supporting, the simpler nest, suitable for warmer weather, is quickly finished for a second set of eggs. None of the books will tell you this, for, sad to say, most of the men who write books have forgotten the time when they were boys, and could find birds' nests.

Industry, constancy, cheerfulness, and many other virtues might we learn from Black-cap. So long as trees grow, may he thrive; and, if he and his fellow-protectors of the forests thrive, so long may trees grow.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

SPEEDING THROUGH SPACE

BY ISABEL M. LEWIS

HERE on our planet Earth we would feel that we were establishing a record for ourselves if we could attain a speed of 450 miles an hour, or seven and one half miles a minute, in an aeroplane. So far man has not been able to attain any such speed on land, water or in the air by any means at his disposal. Yet while I have been writing these few words we have moved through space more than a hundred miles without even being aware of the fact. The earth is rotating on its axis at a speed that carries a man at the equator eastward at the rate of more than a thousand miles in an hour. At the same time our planet is carrying us onward in our journey around the sun on the average of eighteen and one-half miles in every second. This speed is slower when we are at aphelion, or the point in our orbit farthest from the sun, and more rapid when the earth is at perihelion, or the point nearest to the sun. Only in a perfectly circular orbit would we be moving at a uniform velocity.

Then too, our sun is moving onward through the universe taking his family along with him. That journey is being accomplished at the rate of twelve and one-half miles in a second, and, of course, we share in that motion also.

The rising of the sun, moon, planets and stars in the east every day and their setting in the west are the result of the turning of the earth on its axis once every twenty-four hours. Our motion around the sun is reflected in the apparent eastward motion of the sun among the stars and the fact that the stars come to the meridian about four minutes early on each successive night. The fact that we are moving onward among the stars at the rate of twelve and one-half miles a second is known from the nature of the proper motions, that is the individual motions, of the stars with respect to the sun. If it were not for a knowledge of these facts and a proper interpretation of their meanings we would not know that we shared in these three motions, that of the earth spinning on its axis, of the earth in its yearly motion in its orbit around the

sun, and of the sun itself in its journey among the stars.

The sun is very old. It is now believed that it is at least several thousand million years since our earth was formed, and in that time we have been carried onward with our sun through space thousands of light years and unless our sun has been describing an orbit of its own among the stars, which is considered unlikely, then we have visited far distant regions of space and constellations have gradually changed in form and disappeared, to be succeeded by others of different form and brightness. In all of that inconceivably great interval of time required for such changes to take place we have been speeding onward around the sun year after year at a speed of eighteen and one-half miles every second and onward through space twelve and one-half miles per second.

Some slight knowledge and realization of the terrific speed of celestial bodies comes to one who is fortunate enough at the time of a total eclipse of the sun to see, for a brief second or so, the advance of the shadow of the moon across the surface of the earth at the rate of about half a mile in a second. So rapid is the passage of the shadow of the moon over the surface of the earth, however, that few are able to see it and then only from a lofty elevation from which one may get a view of the country for many miles around. At that our moon is not a particularly active body and compared to average celestial velocities that of its shadow is extremely slow. The motion of the moon in its orbit averages only 2287 miles per hour or 3350 feet per second. It is, in fact, one of the slowest moving bodies in the solar system. The most distant planets, Neptune, Uranus and the newly-discovered Pluto, and comets when far distant from the sun, move slowly in comparison to the innermost planets such as Mercury, Venus, the Earth, and Mars, and comets when near the sun. Neptune moves around the sun in its orbit at a speed of about three and a third miles a second and even at that rate of speed takes 165 years to make one trip around the sun. Since the date of its discovery in 1846 it has completed only a little more than one half of its trip around the sun.

Uranus travels a little more than four miles in a second and takes eighty-four years to complete one revolution. Saturn moves six miles in a second, Jupiter about eight miles, Mars fifteen miles, the earth eighteen and one-half, Venus nearly twenty-two miles and Mercury on the average thirty miles a second, although its orbit is so elliptical in shape that its distance from the sun at perihelion is nearly 15,000,000 miles less than it is at aphelion. So its velocity in its orbit varies from about thirty-six miles per second at perihelion to twenty-four miles per second at aphelion.

The planet Pluto travels in an orbit even more elliptical than that of Mercury. Although its average distance from the sun is 900,000,000 miles greater than that of Neptune and its average motion in its orbit is about three miles a second, it comes at perihelion inside of the orbit of Neptune and at that part of its orbit moves more rapidly than Neptune. This little body, which is believed to be only about half as massive as the earth, takes about 250 years to make one revolution around the sun.

All celestial velocities, whether of bodies belonging to the solar system or to the greater system of the stars in which our solar system is but a unit, are measured in terms of miles or kilometers per second. Our sun appears to be moving at about average speed for a star. The great gaseous nebulae and the brilliant helium and hydrogen stars, such as Rigel, Spica and Vega, move more slowly than the average star and in general the reddish stars move the most rapidly. There are also "runaway stars" as they are called, generally reddish in color, that are moving at speeds far in excess of the average stellar speed.

Most remarkable of all celestial bodies are the spiral nebulae that lie at distances of hundreds of thousands or millions of light years from the earth and that are apparently moving at the terrific velocities of several thousand miles per second away from the earth. Why these great island universes, as they are known to be, should be receding from the earth in all directions is a mystery. The velocities of these objects are determined by the shift of the lines in their spectra toward the red, the well known Doppler effect, as it is called, which is assumed to indicate recession of the object from the observer. It is now suspected that there may be some other interpretation to be placed upon the shift in the spectral lines of these stars. It has been suggested that when a body has been radiating light for a great length of time and has lost much of its energy its vibrations may slow down and, as a result, there will be a shift in the spectral lines toward the red. There are many puzzling facts to be explained regarding these far away island universes and their peculiar shift of spectral lines. It is possible that some remarkable discovery may be made or some theory confirmed through observations of these great spiral nebulae, that arouse our wonder and curiosity because of their tremendous size and distance and their peculiar motion with respect to the earth. It is believed that they may even furnish proof of the curvature of space and give further support to the Einstein theory of the nature of space, time and matter. They are by far the most interesting objects of investigation in the astronomy of today and their unheard of velocity of motion through space is the most astonishing thing about them. Most of them are extremely faint objects only visible photographically in the most powerful telescopes.

Among the stars this month, Arcturus, Spica and Regulus are visible in the eastern half of the sky, with Vega just appearing above the northeastern horizon. Hydra fills most of the southern sky from a point south of Cancer where a small group of stars marks the head of the Water-snake to a point on the southeastern horizon near Spica. The two riders of Hydra, Crater, The Cup, and Corvus, the Crow, are now conspicuous in the southeast. Alphard, the second magnitude star that is the brightest star in Hydra, stands in a lonely position to the southwest of Regulus, which is now nearly due south. Orion is now nearly on the western horizon, but Gemini, The Twins, is still well in view in the west and to the south

and southeast of Gemini. The two Dog-stars, Sirius and Procyon, are still in view, although Sirius is rapidly nearing the southwestern horizon. Capella is still a beautiful object in the northwest following Taurus, which is now close to the western horizon. The Big Dipper is in fine position for observation high above the pole.

Among the planets this month Venus will appear as a magnificent Evening Star. It reaches its greatest eastern elongation on April 19 and sets about four and one-half hours after the sun. It is now at its best in the evening sky. Jupiter is still in Cancer and it is about equal to Sirius in brightness. It is near the meridian at sunset. Mars is now in Pisces and in the eastern morning sky but is too low in the east at sunrise to be seen to advantage. Saturn is in Capricornus and rises about three hours before the sun in the middle of April and its distance from the sun is increasing. Mercury is too close to the sun to be seen to advantage this month.

"HYDROPHOBIA" SKUNK

BY LEWIS W. WALKER

AN EASILY TAMED PET

The spotted skunk never attacks his friends, and even his enemies can circumvent him by holding him by the tail

THROUGHOUT the western states there is a small black and white animal called "The Spotted Skunk." Concerning him a false superstition, which in many cases is the cause of this innocent creature's destruction, has arisen. Inhabitants in regions where this animal abounds state without hesitation that his bite brings on hydrophobia. Regarding the veracity of this statement, however, there is no proof. I do not say that the skunk never contracts it, but he is no more subject to it than any other creature. I have found it impossible to locate a recovered victim, or a deceased victim's family. Surely this skunk's powers must be potent to eliminate whole families, and the witnesses of his attacks also! Persons professing to believe, and who spread this belief, always know of "the friend of a friend" who has suffered from this animal's bite. Sometimes they tell of an incident in which a skunk was killed before he was given a chance to "fatally innoculate" his proposed human victim. This last-mentioned ending occurs often—far too often, in fact, considering the skunk's undoubted economic value.

THE VICTIM OF STRANGE BELIEFS

Instead of being a dangerous character, the spotted fellow is an economic asset and a worthy playmate

During the dark hours of the night, this arrogant prowler wanders about with a lumbering, bravado gait in search of insects and mice. On these forages he has the self assurance of a large bear. Fear seems to be entirely missing in his makeup. Sometimes a spotted skunk will allow a dog to approach to within less than a yard, before showing any sign of concern. Suddenly, however, his front feet will stamp on the ground in a war-dance, a signal of danger. His tail will rise and spread. If the dog continues to annoy, it is a sure sign to the onlooker that this pup's experiences in the past have been mild compared to the one about to take place.

This smallest member of the skunk family uses his "atomizer" only when forced, and never indiscriminately. I have even heard of cases of this skunk being ejected from a porch with the aid of a well-aimed foot, without his resorting to the protection of his effective weapon. Due to their lack of fear they are very easily tamed, uncaged, and as wild pets they cannot be equalled. If the people who kicked the skunk from the porch had instead made an attempt to feed it, soon it would have acquired sufficient confidence in humans to come at a familiar call or whistle. They rapidly learn to discern friends from enemies, and will without hesitation climb into pockets in search of various foods.

THINGS TO THINK ABOUT

A PAGE DEVOTED TO CONSERVATION FROM VARYING ANGLES

• • •

Inexcusable Education

We quote the following letter from a young man with sense and sensibilities:

"I am here making an appeal to you. I am thirteen years old, and attending first year high school. It is compulsory to study General Science for one year. My mother has always taught me to be kind to animals. We also have a national 'Be Kind to Animals Week'. I also subscribe for NATURE MAGAZINE, because of my love for Nature. But the cruelties I am taught to observe during my Science periods are sometimes unendurable. Today we had to watch how our teacher etherized a frog. Another frog was placed in alcohol to intoxicate him. Another frog's head was cut off and he was allowed to hop around headless, then placed in a bowl of water and it was still jumping around, finally clinging to the edge. Then he strung it onto a wire and put ether on one hind leg and told us to watch how it took its other leg to wipe the ether off. And more torturing methods followed. Now I beg you how can I love animals and watch my teacher slice them open to observe their hearts beating? Isn't there something, please, that you can do to prevent all these cruelties from taking place in our classes? I beg your most earnest cooperation in this matter, and hope to hear from you soon."

This young man has called to our attention a startling condition. We do not believe that it is general; but if it is, supervisors of science in our schools have a corrective job to do without the least delay. We are inclined to feel that this specific case is an isolated instance, because we are not acquainted with any general science outline, any general science text or any recommended procedures for senior high school biology course that include any such insensate or barbaric proposals.

In this particular instance we are inclined to feel that the teacher has indulged in a pre-medical course somewhere and lacks the common sense to differentiate between teaching children of the age of our correspondent and the methods of research of college courses. It would appear that some young teacher is misapplying his education in science by attempting to parade his knowledge in a place where it does not belong.

There is no justification whatsoever for the practices described above in any high school biology or general science class. We know that the National Council of Supervisors of Elementary Science recognizes this fact. Specifically we call upon the Supervisor of Science for the City of Chicago to put an immediate stop to these misdirected efforts.

Trap Law Constitutional

The Supreme Court of Massachusetts has held the anti-steel trap law passed in 1930 constitutional in a recent decision overruling the exceptions of Joseph H. Higgins of Barre, convicted of violations under the act. Chief Justice Arthur P. Rugg, who wrote the opinion of the full court, said in part: "It must be held, therefore, that the statute in question was intended to be in the interest of public morals. . . . The capture of a wild animal contrary to the provisions of this statute undeniably must cause injury to the part of the body caught in the trap, with attendant pain. It falls within the general category of cruel treatment."

The New Migratory Bird Board

In NATURE MAGAZINE for March was announced the dissolving of the original Advisory Board, Migratory Bird Treaty Act, and plans for creating another. The membership of the new board has not been announced, but we are assured that it is to include two farmers and *one* bird protector. The statement issued on February 3 by Secretary of Agriculture Hyde follows:

"I announced, January 13, 1932, a plan for the reorganization of the Advisory Board, Migration Bird Treaty Act.

"This new Board representing all regions of the country will have matters to consider that may have a relation to lands which heretofore have been, or may hereafter be used for agricultural purposes. For that reason it is desirable that the Board shall have as members two representatives of farmers. It should also have one representative of the bird protective organizations of the country.

"I have already asked the game officials of the various States to send me promptly nominations for regional members of such Board. If the nominations coming from the States do not include representatives of the farms and protective organizations, I will assume the responsibility of selecting them from the representatives at large. I shall endeavor to have the first meeting of such Board held as early as possible.

"The representatives at this meeting will be requested to determine the Board's policies on such subjects as length of seasons, zones, shooting restrictions and other measures for increasing the supply of both upland game birds and waterfowl, and measures for conserving the existing supply.

"Meetings of such Board will be held at least twice in each calendar year and at such other times as I may call its members together.

"The Board will also be available, of course, for reference to them of such questions as may arise from time to time, upon which the advice of the Board is desired. It is planned to secure the advice of the Board upon all regulations submitted to me by the Bureau of Biological Survey before they are approved."

Waterfowl Shortage Proved

The following statement was issued by the Department of Agriculture on February 23:

"Waterfowl flights and concentrations in various sections of the United States were generally smaller last fall than in previous years, the waterfowl investigations by the Bureau of Biological Survey, U. S. Department of Agriculture, show. Shortages were especially severe among canvasbacks, redheads, and lesser scaups—the birds whose breeding ranges are largely in the Northwestern States and in the Prairie Provinces of Canada, the area most seriously affected by the long drought.

"In a few regions unusually large local concentrations have been observed, but these, the bureau explains, are a result of the mild weather and of the great reduction in water and food areas that followed the drought. Frequently local observers of these unusual abundances have concluded erroneously that the wildfowl must be proportionately numerous everywhere. Investigations, however, show that except in limited regions ducks were far less plentiful than in past seasons.

"These investigations by the Biological Survey constitute the most comprehensive and intensive field study that has ever been undertaken to obtain reliable information on the abundance of waterfowl on their wintering grounds. Biologists of the Department of Agriculture have traced waterfowl migrations from early fall until the birds reached their wintering grounds. These observations have been supplemented by regular reports from game protectors, wardens, and other field employees; by reports of investigations conducted by various State game commissions; by the records of several hundred experienced observers cooperating with the bureau; and by information based on the experiences of hunters both in Canada and the United States. These sources have been mutually corroborative in indicating a shortage of waterfowl.

"There is reason, however, to believe, the Biological Survey stated, that the emergency regulations which shortened the 1931 hunting period were generally respected by American gunners. This restraint, combined with the mild season, tending to retard southward migrations and offering little good hunting weather, has effected a considerable saving of ducks which will be able to return to the nesting grounds in the spring. The numbers of geese have been more nearly normal than those of ducks.

"If there is also a favorable 1932 nesting season, the bureau suggests, the condition of the waterfowl may be sufficiently improved to warrant some extension of the hunting privileges next fall. The bureau is continuing its investigations and in the spring will send biologists to important northern breeding grounds to investigate conditions and obtain further information to assist officials in determining the regulatory policy."

Briefly, this seems to say that ducks were much reduced as compared with previous seasons, and that the gunners were not able to kill as many as usual. There is little doubt, however, that they are now praying for good weather for ducks and a longer open season.

PLANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

The rush of April work in the garden should not prevent you from making careful notes of bulbs as they flower. If you made plantings last fall, check up on your varieties and note where improvements may be made or additional bulbs planted. Should your garden lack liberal plantings of these spring blooming gems, now is the time to select and work out schemes for their arrangement. Careful notes should be made as to variety, color, height, date of bloom and also combinations that are desirable. Plantings in your friends' gardens should be studied, as well as the show gardens of nurseries and seedsmen. If none are available, it will pay you to make a test garden planting of your own next fall and when spring arrives you will be able to study varieties and plan schemes to your liking. A dozen bulbs each of as many varieties as your purse affords will provide a test garden of great interest.

Don't be in too great a hurry to start your spring spading. Working soil while it is still wet and cold leaves it in lumps and clods rather than loosely pulverized as is desirable. Test your soil by squeezing a handful; if it remains a solid mass, it is still too wet. Proper soil preparation plays a major rôle in all garden success and the amateur cannot afford to slight it.

Early spring is time to make a concerted drive against weeds in the lawn. Digging them out is doubtless the most effective system. As you remove them, fill the holes with good soil, sprinkle a bit of seed and roll or firm the spot. The hand picked lawns we all admire don't "just happen"; they are the result of hard work and stick-to-itiveness. And don't forget weeds are more prevalent in soils that are sweet and alkaline. Excessive use of lime and bone meal encourages weeds by maintaining the soil too much on the alkaline side. A neutral soil that is neither too acid nor too alkaline is generally to be preferred. Feeding with 6-8-6 or 4-12-4 commercial fertilizer at the rate of four pounds to 100 square feet is good spring practice.

Box and privet hedges should be trimmed before growth starts. The latter will stand severe cutting back which is quite necessary to keep it within bounds. Good practice advises trimming hedges narrower at the top than at the base. This permits free access of sunlight so necessary to healthy growth. If you have not already done so, now is the time to prune all roses except climbers. Cut the hybrid teas back to within

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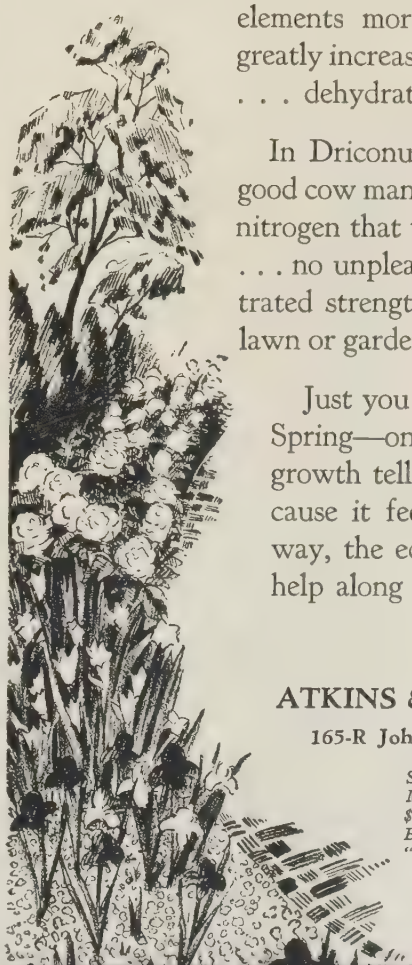

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COLORADO BLUE SPRUCE is profitable to grow. 25 three-year trees $1.00 postpaid. Bargain list free.
RANSOM NURSERY GENEVA, OHIO

four to six inches of the ground and the hybrid perpetuals to within six to eight inches. Don't be afraid of cutting them too severely. Better blooms result from severe pruning.

Plant sweet peas just as soon as the ground can be worked. Prepare the soil deeply and their roots will penetrate deep, much to the benefit of the plant and blossoms. Do not plant too close; six inches between plants is desirable, with pinching back to make them branch. Slightly alkaline soils are best for sweet peas and the addition of superphosphate at the rate of five to ten pounds per hundred feet of trench is desirable. It is almost useless to try growing sweet peas in poor, shallow, heavy, poorly-drained sour or thin soils. They demand well-prepared soil and it must be cool to get the best results.

There is much work that may be done among the perennials at this season. The following are best transplanted in the spring: anemone, japonica, fall asters, ceratostigma, monarda, helenium, golden glow, shasta daisy, achillea and boltonia. Some of these spread so rapidly they almost become weeds if not lifted, divided and reset frequently. Where soil is dry and well drained, iris may be planted now, but the best practice postpones this work till midsummer. They will withstand almost any misuse at that season.

Do not neglect your newly-planted material. Trees or tall shrubs which may be whipped by the wind should be carefully tied to stakes or serious losses may occur. Water, too, is important to newly-planted material; their disturbed root systems are struggling under a handicap. A mulch also is valuable over the surface to conserve moisture and keep the soil cool. Once their roots start growth, they will become firmly anchored and able to shift for themselves.

Early plantings of gladiolus may be made as soon as the soil begins to dry out, but the main planting should not be put in too early. Should the coming weeks prove wet and cold, bulbs might rot rather than grow. In your glad planting this year try some of the smaller sizes, say number four or five. Fours generally list at about forty per cent the price of number ones, and fives around thirty per cent. Not every grower sells these smaller sizes, but there are several good dealers who do and, except for exhibition purposes, the smaller sizes produce almost as fine blooms as the large ones. The smaller bulbs make extra fine stock to carry over.

Should late frosts visit your borders, spray the affected plants with cold water, before the sun gets at them, and shade them from the sun if possible. A sprinkler system has proved immensely valuable in many a garden where late frosts would otherwise have wreaked havoc.

As you plant and transplant in your borders and beds, keep in mind the colors, heights and season of bloom. Just as an artist blends colors upon his palette to secure the desired effects, so you should blend the colors in your garden. This may not be easy, at first, but gradually as your knowledge of plants grows you will become an expert with these living pigments. Don't be discouraged if your garden picture does not measure up to expectations the first year or even the second or third. Good gardens are developed slowly and are

generally the result of many years' efforts.

Do you know that in recent years rose enthusiasts have learned that reasonably good roses may be grown in partial shade? Locations with sun only a small part of the day, such as under trees and among shrubs, have produced excellent roses. They have even succeeded near tree roots, though not the roots of elms or poplars. Shady gardens are, of course, more of a problem than sunny ones but study and care will overcome most difficulties.

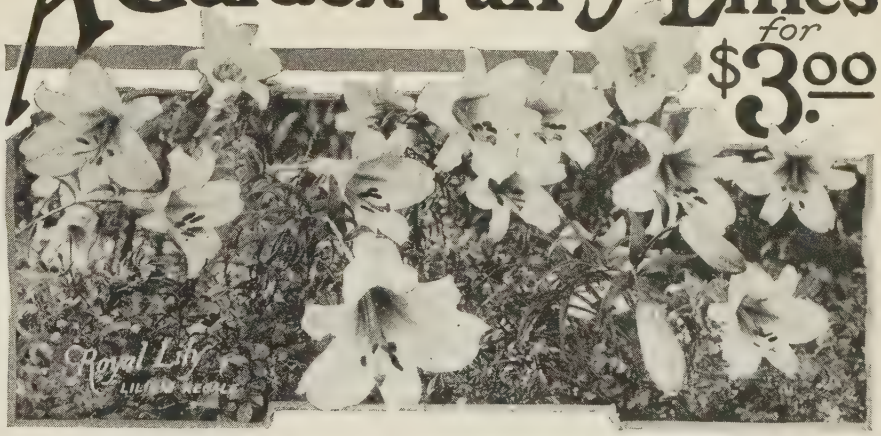
Plan now to exhibit at the flower shows. Plant with this in mind. The friendly competition of the flower shows is one of the joys of gardening. If you have room, make special plantings of various things especially for the shows. Should there not be any show planned for your locality, get busy and plan one. This is the season for organizing. You will find your neighbors and friends ready and willing to do their parts and the result will be evidenced by better gardens and more quality flowers. If you are not familiar with flower show arrangements, get a copy of "The Garden Club Manual", by Mrs. Fisher, Macmillan, 1930, priced $2.00. Every garden club, no matter how small, should own this book.

If you are planting any lilies this spring, soil preparation should be made at once. Few gardeners realize the need of deep preparation. Regal lilies, for example, need to be set with their base eight to ten inches below the surface, and when you realize they send their roots down two or three feet below this, you can understand why deep preparation is advised. Lilies enjoy a loose, friable soil with plenty of leaf mold in it. They resent fresh manure and commercial fertilizers. Poorly-drained locations are fatal to them and most varieties enjoy partial shade, at least they like to have the soil over their roots shaded from the hot sun.

Don't postpone putting up some bird houses. These feathered friends are more than worthy of attention. They repay us many fold for any kindness we show them. Bird houses should be built to provide for ventilation or the heat of summer will make them untenantable. Never paint the inside of a bird house, and some claim the entrance opening should not be painted. Different types of houses attract different birds and you will do well to study your bird neighbors and seek to make conditions to their liking. "How to Attract Birds in the Northeastern States", Farmer's Bulletin No. 621, may be had from the U. S. Department of Agriculture. Similar bulletins are available for other sections: No. 760 for northwestern states, No. 912 for east central and No. 844 for middle Atlantic states. No. 1456 covers "Homes for Birds" and No. 1644, "Local Bird Refuges".

Be sure to plant some montbretias this spring. The newer varieties, especially "His Majesty", are vast improvements over the older types. Blooming in the latter half of the garden year, they lend a charming effect of gaiety and lightness to the borders. The variety mentioned above is nearly twice the size of the old varieties and now that it is being produced in quantity the price is becoming more reasonable. These delightful bulbous flowers should be planted in groups of at least a dozen, well to the front of your borders. As the bulbs are small, set them but a few inches apart and they will

A Garden Full of Lilies for $3.00



Lilies for Spring Planting

American garden lovers, who have been in the habit of planting their lily gardens in the autumn, will be pleased to know that they may now secure many of the finest lily bulbs for spring planting.

This has been brought about by the wonderful advancement made in the science of refrigeration, with the result that commercial florists have been growing them to bloom at any time of the year desired from bulbs taken from cold storage.

Special Offer—12 Beautiful Lilies for $3.00

Three Bulbs Each of Four Fine Varieties

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MANY NEW ROSES from foreign fields and American growers are now available from our great collection of modern and older varieties. In the group are Roses presented to America for the first time; others have been favorably observed for two or three seasons. Among them are:

Helen Fox. Golden yellow.
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President Deville. Rosy red.
Henri Linger. (Cl.) Yellow.
Mme. Charles Lejeune. (Cl.) Pink.
Aphrodite. Coral-red.
Dr. Heinrich Lumpe. Rose-pink.
Hermann Lindecke. Pink.

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our comprehensive book on Roses, has been completely revised. A chapter on new Roses, as well as other departments, will be valuable to Rose-growers. A copy will be mailed on request to those who intend to plant Roses.

FOR several seasons we have been assembling a stock of

Old-fashioned Roses

many of which are extremely rare. Among these may be named the Moss Roses, the Damask, the Provence or Lawranciana types, dating back even to the 16th and 15th centuries, and many others. These Roses will be discussed in our new booklet "Old-fashioned Roses" to be published in the spring of 1932.

Other publications include "Evergreens, Trees and Shrubs," "Hardy Herbaceous Plants," and "Home Grounds."

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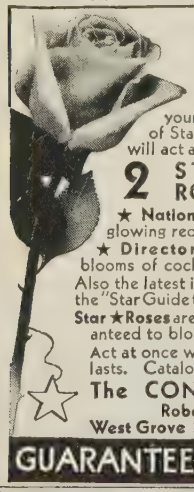

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make delightful fountains of color for many weeks. As cut flowers they are ideal, lasting a long time in water. A quantity of bulbs planted in the cutting garden will prove most useful. They are perfectly hardy south of Philadelphia but north of this point are best handled similar to gladiolus.

As the season proceeds, plant according to the weather. Don't hurry things if the spring is cold and wet. There can be no set rules for planting in spite of what you may read to the contrary. Read and study the garden experiences of others, but use your own judgment as to when you should plant. Until you have actually experimented and learned certain definite things, you may make lots of mistakes. It is by our mistakes, however, that we learn and only by actually doing things will we discover the right way to proceed. Year by year your garden will improve if you learn the lessons it teaches.

Saving Flora

An interesting suggestion directed toward the preservation of our native flora has been made by Frank A. Schilling, writing in the *Bulletin* of the Nature Club of Southern California. He recommends amending the homestead laws of California to prevent any but bona fide settlers from acquiring land on the state domain, and to make as prerequisite to homesteading the development of water, without which the flora could not be cleared away. "Commercial interests," he writes, "should not be allowed to settle on these lands, strip them of their native flora, and then abandon them." He also hopes for an amendment of the state's conservation laws to prevent the importation of native plants from other states except for scientific purposes, and is particularly desirous of keeping out the cactus from Arizona.

Queer Creatures from Siam

The Smithsonian Institution is the proud owner of strange Siamese creatures which surpass even the imagination with their grotesqueness. They are presents from Dr. Hugh M. Smith, former chief of the United States Bureau of Fisheries, who is now developing Siam's fishery resources. One of the queerest is the giant water lizard, the hia, which of all living animals most closely resembles the great dinosaurs as it dashes through the jungle with its long neck, small head, and long, heavy tail. Another is the "tail-biting snake", or ngu kon kob, which, the Siamese are convinced, bites with its head when the moon shines and with its tail on dark nights. One of the most beautiful in Dr. Smith's collection is the "sun-ray snake" which has a glowing iridescence suggestive of its name, and the most agile is the ngu saiman praindra, able to leap a distance of at least seven feet.

Holt Sanctuary Director

Ernest G. Holt, well known naturalist and explorer, who recently traversed the upper reaches of the Orinoco River for hundreds of miles, has been appointed director of Sanctuaries for the National Association of Audubon Societies. The Association protects about seventy different areas, all devoted to birds and mammals or nesting colonies of sea and other water birds, in various parts of the country.

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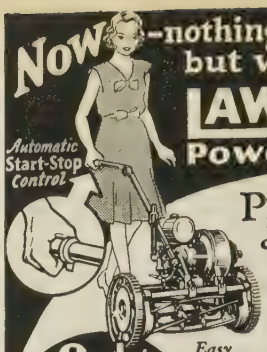

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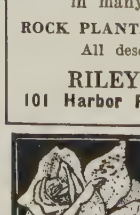

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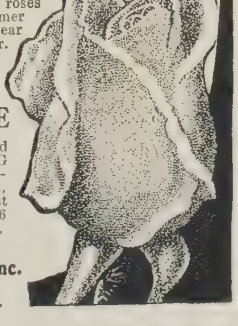

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bulbs the king of all Flowers. My descriptive catalog will be mailed you free upon request. It lists about 200 varieties at post paid prices.

LEONARD C. LARSON
186 West Winchell St. Portland, Oregon

The essay that follows is appropriate to this month and carries a real message. It is the work of an Eagle Scout and was selected as the best one written on the subject by Boy Scouts of Boston and vicinity. It is sent to us by one of our members, Mr. George H. Crosbie, who is active in Massachusetts Boy Scout Work

CONSERVATION OF OUR WILD FLOWERS

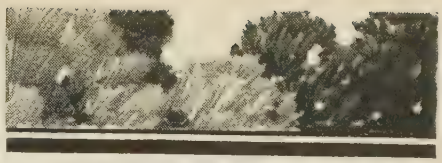
By Charles S. Frary, Jr.

Many of our beautiful wild flowers are disappearing at a very rapid rate, due to many causes that, if not corrected soon, will leave us without those we now enjoy. Chief among these threats is the mania that comes in the springtime when everybody wants to get out and enjoy Nature, and when they return, they bring Nature with them back to their flats and apartments. Nature has usually been torn up by the roots to satisfy the thoughtless "naturalist". It is a common sight to see bouquets of wild flowers—(and usually the rarer ones)—lying beside the road, wilted and half-dead, picked by some unthinking city dweller and cast away when they began to droop. This is more common in the spring than in the fall, for the flowers of spring are much frailer and more delicate than those of autumn.

Such people as those mentioned are careless in the way they pick the flowers, and more times than not, they pull the plants up by the roots, as is often the case with the wild columbine, or tear limbs off trees or shrubs and leave a splintered wound that serves as an ideal entrance for fungus diseases and rots. This happens often in the case of the flowering dogwood. These are the chief practices that must be combated. Picking the flower itself prevents the increase of plants of a like nature, but pulling the plant up bodily also destroys the parent plant and reduces the number of plants that were in existence. Then, too, thoughtless people do not consider the interests of others, and pick every flower they see around, leaving none for others to enjoy. This is disastrous to the plants in many instances, such as in the case of the pink ladies' slipper, which cannot propagate itself by underground roots, but must reseed itself.

Other people make the unintentional mistake of transplanting a wild flower from its native habitat in the woods to a place in a flower bed that is altogether unsuited for it. A flower that is used to shade, acid soil, or plenteous water supply will not grow if these necessary elements in its life are removed or changed. One should be very certain of these things before one attempts to start a wild flower garden.

Then there is the forest-fire hazard. Fire is probably the worst foe of the forest and field. It destroys the valuable surface humus, and there are few plants that can live on the charred ground of a burned-over piece of land. Fire destroys the trees, and it is chiefly the trees that prevent the land from becoming gullied and barren, and that hold back the water and humus from being washed into the rivers and down to the sea. If the trees are gone, the land is soon ruined, and the rivers are filled with mud. They dry up in summer, and floods occur in the land around the mouth of the river. Thus it is decidedly important that the danger of the forest fires be forcibly brought



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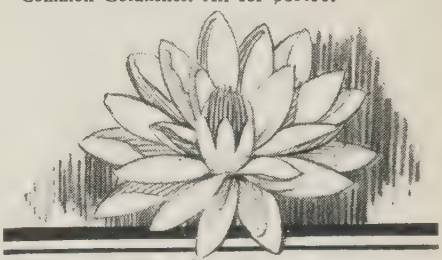
Includes 1 pair Giants, 2 pair Young Giants, 1 pair American Fantails, 12 Shubunkins, 12 Common Goldfishes. All for $15.00.



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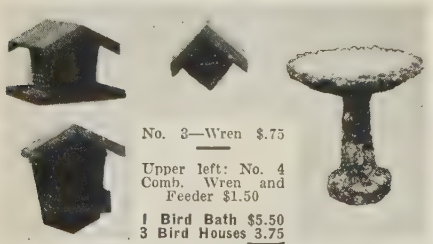

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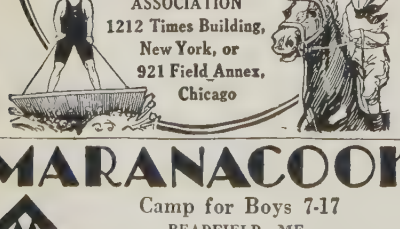

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to the attention of the public in all efforts toward conservation.

Another factor that is rapidly destroying our wild life is the practice of paper mills and the like to destroy the forest by excessive lumbering, and then to fail to replace the forest with seedlings to mature for future generations. All the wild life of the original forest is mostly destroyed, and the succeeding life leaves much to be desired. Many states have made the mistake of designating a rare or rapidly disappearing flower as the state flower. This gives rise to a more rapid disappearance, as the people search out their state flower, and the state and country are that much worse off in their supply of wild life.

National and state reserves are needed to protect the flowering dogwood, the redbud, and anemone, ladies' slipper, dwarf cornel, trillium, bellwort, pitcher-plant, sundew, wild columbine, and many other wild flowers that are even now becoming scarce. Private and municipal reservations are rather scarce, and are much needed and desired. It is to be desired that the country become more "Nature Minded", and that more definite steps be taken to preserve for the future the life and beauty of the trees and flowers of the present.

For Better Gardens

Last year, the Union Fork and Hoe Company distributed 350,000 volumes of Harry O'Brien's well-written and practical garden handbook, *Better Gardening*. The 1932 edition is so much larger and includes so much more material of interest to every gardener that we venture it will surpass the 1931 record. Chapters on pruning, indoor aquariums, house plants, shrubs and trees, the vegetable garden, rock gardens and a host of other gardening subjects are supplemented by numerous illustrations. You will find the book a mine of information and suggestion and as practical as a New England housewife. It is priced at 10 cents, and is sold from the general offices of the Union Fork and Hoe Company at Columbus, Ohio.

Iowa's Survey

Iowa has been a splendid spender in the past. Now she is wondering where her forests, her sparkling lakes, her fine trout streams and her wild life have gone, and is devoting considerable thought to methods of bringing them back. Jacob Crane, architect and planner, is directing a survey of the state upon which shall be based a long-term conservation plan which shall enable the state to spend her conservation appropriations wisely and to bring back some measure of the natural beauty that once existed. The survey is sponsored by the State Fish and Game Commission and the State Board of Conservation jointly, and all conservation organizations are cooperating with them. The plan is to be completed by the summer of 1933, and its details will be studied by conservationists everywhere with interest.

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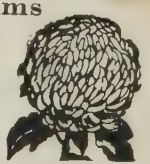

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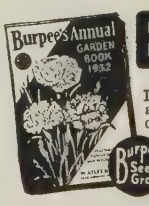

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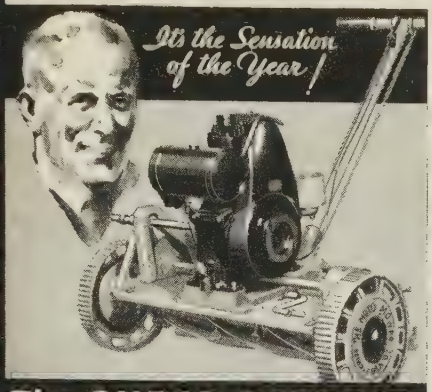

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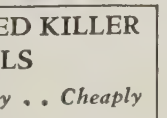

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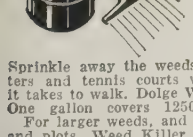

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Chapman Handbook

The 1932 revised edition of Dr. F. M. Chapman's *Handbook of Birds of Eastern North America* is being most enthusiastically received by bird lovers everywhere. For thirty-six years Dr. Chapman's manual has been the reference book par excellence for both beginners and more advanced ornithologists. The present revision was made necessary by extensive alterations in the recent check-list of the American Ornithologists' Union, wherein the birds have been reclassified and many names changed.

In adopting these changes, therefore, the hawks and owls are now widely separated. The thrushes' former position at the end is now occupied by the finches—a more numerous but far less refined type of bird. However, the common names precede the scientific in the descriptive text, giving us a feeling of familiarity—a friendly touch.

To Dr. Chapman must go the credit for having popularized the study and appreciation of birds more than any other ornithologist. His keen mind and deep affection for his subject made possible this marvelous book which has through long experience fully demonstrated its usefulness. In this edition Dr. Chapman has added much informative matter, and brings the subject up to date with all of the latest knowledge of birds gathered from every possible source.

He tells of their economic importance; how one can identify them; gives their new classification and names; delves into all their wonderful activities, such as migration, song, nesting seasons and food; details the technique of collecting and banding; includes easy field keys for identification by the novice; makes of it a superb field guide for everyone interested in the pleasure and profit to be derived from the study of birds.

That the original edition has so well stood the test of years speaks volumes; and all of us want this new book, knowing that we will have the latest and the best information possible in a textbook and one that will be adequate far into the future.

There are fifty pages of new text, and to the former illustrations by L. A. Fuertes, Tappan Adney and E. T. Seton have been added a number of line cuts and full pages by Francis L. Jacques. It is published by D. Appleton and Company, New York, and the price is $5.00.—R. B. H.

Art and Handwork

A textbook for teacher training classes and a desk manual for teachers in service, *First Steps in Art and Handwork,* certainly achieves its objectives. It is written by Ella Victoria Dobbs, Professor of Applied Arts at the University of Missouri. We found it particularly interesting, totally aside from its pedagogical application, since it deals with the directing of those first creative efforts of the youngster. We confess to have marvelled at the patience that must lie behind the stimulation of these efforts by the teacher, and we felt as though we were eavesdropping on the classroom work in going through this book. We don't know whether this is a new departure in this sort of textbook; but if it is, it is time it were done as well as this author has done it. The publishers are The Macmillan Company, 60 Fifth Avenue, New York City, and the list price is two dollars.

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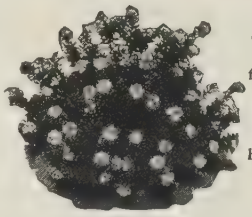

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References: The editors of Nature Magazine. Names of many others who have made these "Westward" trips will be sent on request.

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RANDOLPH AT LA SALLE

SNAIL FOLK

(Continued from page 212)

destroyed by some practical-minded servant or gardener who showed me that a teacup gave forth identical moanings of the ancient seas.

When I found that a remarkable and very beautifully colored creature inhabited a conch shell and that in addition it made exceedingly delicious soup, my pain at its lack of accumulative environmental sound memory became alleviated. As a boy, when I began a collection of shells, I gave no more thought to the owners and makers than I did to the personality of the Knights who had worn the suits of armor in museum cases. I hardly put them in the category that fossils held in medieval philosophy—*lusus naturae,* acts of God, crystalline precipitates—but nevertheless they held places nearer my minerals than my insects.

One day I lay flat in my glass-bottomed boat drifting slowly across Castle Harbor to the north of Nonsuch. I was on the lookout for a reef favorable for diving, but suddenly my eye caught a well-marked trail ploughed through eel-grass four fathoms down. At the end of the furrow was a giant conch. We quickly heaved over the anchor and rigged the diving helmet. When I dropped down the ladder and began scouting around the eel-grass I found it was far from easy to locate the great shells. Their trails were lost in the low horizontal perspective and there were many small, dead heads of coral which I picked up by mistake. At last, I located one and found it extremely heavy even under water. When I turned it over, the huge snail withdrew and rather amazingly squeezed out a bubble of air which, like a levitating pearl, rose slowly through the water. I tucked the creature under my arm and made for the ladder when I saw a second conch and put this beneath the other arm. As I was putting my foot on the lowest rung the surge threw me backward and I stepped inadvertently upon a third conch, the projections of which were so unpleasant that I dropped all three. Miser-like, gathering them up again, I began a one-sided ascent by means of feet, one knee and two fingers, with the trio clutched to me. The moment the conchs sensed one another they either blamed their present predicament upon each other, or the courage of the three together gave them courage to emerge from their shells and attack me. I know exactly how the Spartan youth felt with his irate fox, only I lacked the courage of that Greek Boy Scout and when my muscular snails began hacking at me I dropped them all. Again I tried and again I failed, for the punishing power of their sharp operculum was that of a clamp of a sabre-toothed tiger—their strength and activity were marvellous, and they tore through bathing suit and skin. Finally I succumbed to the humiliation of being beaten by three snails and carried them gingerly up one at a time. This attack and defeat was my first real introduction to the architects and tenants of shells, and it more than doubled the interest in this group of fellow organisms.

I have found that if I wait long enough, all the disappointments that I feel in natural things are proved to be merely the well

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deserved effects of conceit, yet in the great bountiness of Nature even this is not held against me. I unreasonably expected the roar of waves in the helix of the conch, and then the child's regret was partly assuaged by other interests. As I near the end of this account of snails I hear in the distance, over the water, a low, sweet tone, swelling to penetrating power, a crescendo rise and fall and rise again, with a timbre and a certain quality that seems unlike that of any orchestral instrument. I unlimber my high power glasses and far out, toward the sunset, I pick up a fisherman's silhouette, standing in his boat, holding a conch shell to his lips. After he lowers the shell, the slow moving trumpet sound again reaches my ears: And now my last sense of disappointment passes—I no longer regret my juvenile hopes, for the conch has yielded a sound, more intimately its own, more delightful because unexpected, than any pseudo-roar of the surf could ever be.

* * *

And so we sum up our relations to snails; we recall that we put him in fables to personify lethargy; we eat him—gingerly and expensively and Gallically if he be a univalve, or wholesale and with gusto if he be within a hinged shelter. We risk life diving for him and hang the result of his diseases about the necks of fair women; when we are savages we chop up his shell and string it for money, and when a more advanced stage of civilization demands clothes, we dye them with royal Tyrian purple of snail's fluid and hold them together with cunningly wrought rounded bits of nacre.

By far the best relationship, however, is when by association and attentive watching we have dipped deep into the personality of a snail, and by virtue of understanding can call him friend. I carry my remaining—*Frank*—back to his wave-worn rock. He has given me three days of pleasure, has taught me considerable about himself and something I needed to know about my own self, and as a guest his life is safe—tabu. My laboratory table is again free, and of my expedition into the world of snails there remains as material proof only my artist's painting and a long-dried, glairy trail across a split infinitive.

Gastronomic and Encephalic

The Hamilton County Nature Study Club, with headquarters at Noblesville, Indiana, knows how to combine the good things of life, as witness the following which precedes a program of dinners, talks and frolics which are to take place monthly during 1932: "The Gastronomic committees may function at time, place and as per plans of their choice and shall continue until each member has reached the limit of his endurance. The Encephalic contributors should not exceed thirty minutes with the presentations. The Frolic will depend upon the members' recreational fortitude after this debauchery." Typical debauchery to take place some evening in May: "Corned Beef and Cabbage"—James McLean and Hovey Adams. "The European Corn Borer"—Malcolm Bundy. The officers of the club are: Roger S. Roberts, President; Malcolm Bundy, Vice-President; Jean Clarke, Secretary-Treasurer; and Dr. Earl Brooks, chairman of the Program Committee.

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MANY people who *should* be writing never even try it because they just can't picture themselves making "big money." They are so awe-struck by the fabulous stories about millionaire authors that they overlook the fact that $25, $50 and $100 or more can often be earned for material that takes little time to write—stories, articles on home or business management, sports, travels, recipes, etc.—things that can be easily and naturally written, in spare time.

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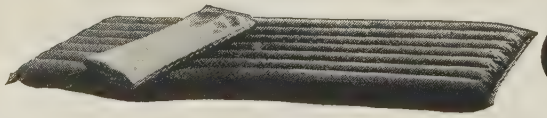

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A BIG CHESTNUT TREE

By Edwin Lincoln Moseley

In the proposed National Park in the Great Smoky Mountains may still be seen the lower part of the hollow trunk of an immense chestnut tree about eleven feet in its greatest diameter and nine feet in least diameter. Before the tree fell, hogs used the hollow for shelter. It was large enough for a dozen or more to lie down in it at one time.

As yet, this huge stump has been seen by very few persons except the mountaineers who live in the region. It is in Tennessee, hardly three miles from Cade's Cove up Eclenecle Creek, at an elevation of between 2000 and 2100 feet. It is not, however, the only forest monarch in the region. Farther up the trail may be seen many large tulip trees that would delight the eye of a lumber-man and a cherry tree the wood of which would keep a cabinet-maker busy for many a day. Under them is a luxuriant growth of rhododendron and mountain laurel. As an example of virgin hardwood timber this part of the Smokies is one of the best remaining anywhere in the entire country.

Lord Grey of Falloden

No one will forget the desperate efforts of Lord Grey, then Foreign Secretary, to stem the tide of war that welled up in the flaming days of July, 1914. Few know, however, that this great statesman is an expert ornithologist, and has often sought the refuge of the field during times of stress to refresh his body and soul. Recently, he made a speech. It was not about war debts or India or the Chinese-Japanese conflict; it was, we are told by the Ottawa *Journal*, about the robin, the English red-breast. Lord Grey told his deeply impressed audience that the robin has been over-poetized; that he is not the gentle little fellow of story, but a truculent, arrogant little bird whose much-admired autumn and winter songs are really warnings to others of his kind to keep off his preserve. He has no such qualms about killing other robins as beset small boys with urges to kill him. In spite of his faults, Lord Grey said, he must be admired for his vigor, his courage and his energy, and as a splendidly vital morsel of life.

It is exceedingly good that great men

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can turn their minds and the minds of their listeners away, at times, from the stress and turmoil of the present day. It is good to have statesmen with a sense of proportion, a love of beauty and Nature, and a sense of humor. The world needs perspective today more than at any other time, and what is better able to give it than a walk in the forest where birds are singing and the sun is glinting through the trees? There one can look back on the troubles of civilization with calm and quiet, and often find the answer to many of the pressing problems that beset mankind.

Tame Mountain Goats

Vernon Bailey wrote in NATURE MAGAZINE about the mountain goat that is not a goat, but it takes Colorado to produce a "mountain" goat that is not a mountain goat. This animal lives with several of his kind on Prospect Mountain, near Estes Park, and is a plain, common or garden variety of tame goat that has perforce taken up an abode amid the peaks. This goat and a number of others were brought to Estes Park some years ago to perform in a rodeo, and were later released. They picked out Prospect Mountain, and are still there, while every summer tourists report that they have seen mountain goats. Rangers in Rocky Mountain Park are finding it more difficult each year to explain when a "mountain" goat is not a mountain goat, and why.

Heath Hen Again

The last heath hen has appeared again. Warden E. Spofford of the Massachusetts Division of Fisheries and Game reports that the bird was seen by James Green and others on February nine and subsequently at the Green farm, near West Tisbury, on Martha's Vineyard Island. The last time it was seen was nine months ago. This bird has been the sole remnant of its sub-species ever since December 8, 1928, and it is remarkable that it has survived so long. It is believed to be more than nine years old. The bird was banded in 1931 by Dr. Alfred O. Gross of Bowdoin College and Thornton W. Burgess.

Industrious Ants

Evidence of the close team-work achieved by ants at their work was obtained by Ranger-Naturalist Joe Burgess of Yosemite National Park recently near the base of a young sugar pine in Mariposa Grove. The ants were evidently making a store house for themselves, he explains in Yosemite *Nature Notes,* and were giving it ample proportions. While a number of them did the boring on the inside, others carried the small chips to the opening and dropped them off, then a third crew pushed them off a lower ledge on which they fell. The number of chips brought out averaged about 18 to the minute. The fact that the same ants were doing the carrying was established by the periodic reappearance of one big ant with peculiar markings. A small wedge placed in the hole of the exit temporarily suspended the labor, but a wrecking gang removed it by dividing into two groups, one to push on the inside, and the other to pull on the outside.

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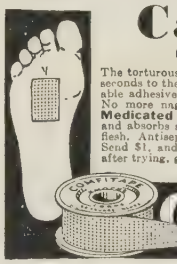

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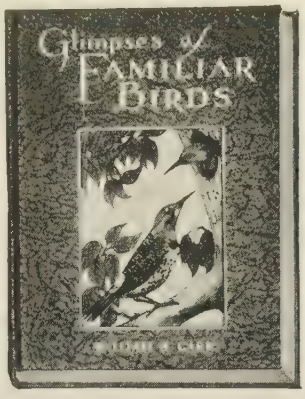

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Steam-Heated Beds

A band of elk in Yellowstone National Park sleeps, each night, on a steam-heated bed. A small plot of level sandy ground in the Midway Geyser Basin is kept constantly dry and warm throughout the long snowy winter months by steam channels which lie close to the surface, and a small herd of wapiti use the spot night after night, according to Yellowstone *Nature Notes*. Ranger Curtis K. Skinner has ascertained that the temperature of the soil is seventy degrees when the air above it is six below zero. Whether the elk that use this spot are less hardy than the rest, who have to paw out their bed in the snow, has not yet been determined.

Nature Club Grows

After a year of existence the Okanagan Field Naturalist's Club is able to look back at a successful twelve months and a phenomenal increase in membership. Nine members were present to organize the club in January, 1931, and today the membership rolls list forty-two. The club held eighteen meetings, sponsored a bird house contest in the schools, presented an illustrated lecture to the school children, and sponsored a wild flower identification contest. Several field trips were made and work with the junior members was furthered. The president is William Simpson and the secretary H. M. Simpson, Box 2, West Summerland, B. C., Canada.

A Deeper Canyon

One of the common questions of visitors to the Grand Canyon is: Is it the deepest canyon in the world? The answer is no, because the great canyon of the Brahmaputra, in northern India, is approximately 1000 feet deeper, according to the Grand Canyon *Nature Notes*. Its depth is measured, however, not from the rims of a high plateau, but from the tops of the mountains that rise directly from the river. The Brahmaputra is one of the largest rivers in India. It rises in Tibet, and empties, after an 1800-mile trip, into the Bay of Bengal. It is navigable for about 800 miles from its mouth.

Freak Antlers

The striking similarity between Old Horny, the famous three-antlered buck of Yosemite National Park who died in 1928, and another buck with three antlers that died this year, suggests the possibility that the two animals were related and that the peculiar growth of the older deer was inherited by the younger. Both bore the extra horn in exactly the same place, in both cases it had two prongs, and grew under velvet, hardened and shed just as if it had been normal. The third antler of the younger deer, however, was but half an inch long, while Horny's was more than two inches long. The skulls of both deer now reside in the Yosemite Museum.

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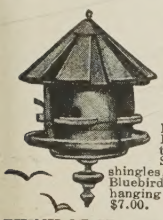

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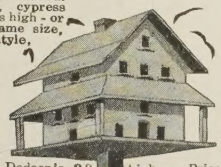

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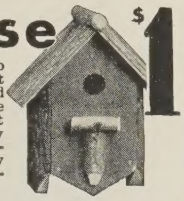

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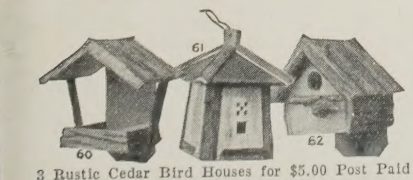

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their numbers was ascertained by the Biological Survey in a recent test flight over flocks of ducks feeding along the Potomac River. The surveys from the air are useful only as supplementary to ground observations, it was concluded, because of the difficulty in identifying accurately the various kinds of birds seen from the air or shown in a picture. The test was conducted by Frederick C. Lincoln of the Survey, who unloosed a battery of cameras on a flock of feeding ducks at different altitudes. Later the photographs were matched and arranged in a mosaic, showing in one great photograph all the ducks in the flock.

Helps for Bird Study

Colored pictures of birds, leaflets, bird pins and outline drawings on paper suitable for crayon or water-color work are waiting at the offices of the National Association of Audubon Societies for the boys and girls who ask for them, T. Gilbert Pearson, President of the Association, has announced. Samples of literature together with full explanations and plans for teaching bird study are available, also, for teachers or leaders of children groups. These offers are made as a part of the educational work of the Association, which, since its inception, has resulted in the creation of 142,011 Junior Bird Clubs in the United States and Canada with a total membership of 4,788,426.

Canada Bird Life

The scientifically-placed chain of bird refuges in Canada insures the perpetuation of every species of bird life now in existence, according to the *Empire Review*. The bird population in the forty sanctuaries now scattered between Montreal and Vancouver has increased 19 per cent since 1925, and the ten sea-bird preserves in the Gulf of St. Lawrence were, in 1930, the scene of the hatching of more than 100,000 birds of sixteen different species. Some of the important birds and the gains they have made are: eider duck, 27 per cent; puffin, 13 per cent; razor-billed auk, 37 per cent; common murre, 11 per cent; black guillemot, 134 per cent; herring gull, 159 per cent; and common tern, 57 per cent.

Are Deer Getting Soft?

Deer in the National Parks seem to like all the comforts of home. While road work was being done recently in Rocky Mountain National Park, Colorado, the workmen burned considerable brush along the road. Several mornings deer were found to be lying near the fires. It was evident that they had slept there for the warmth the blaze gave them. Soon they will be wishing to have hot and cold running water, or, who knows, perhaps a radio.

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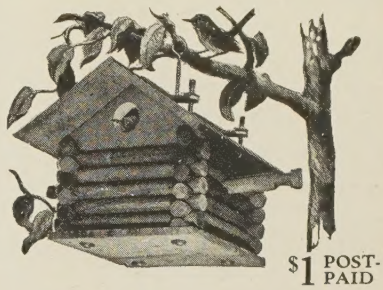

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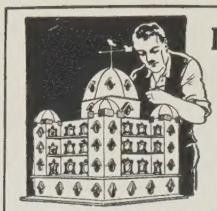

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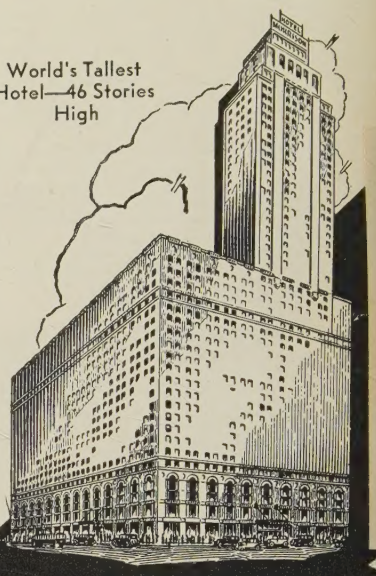

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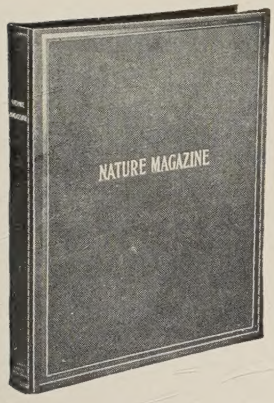

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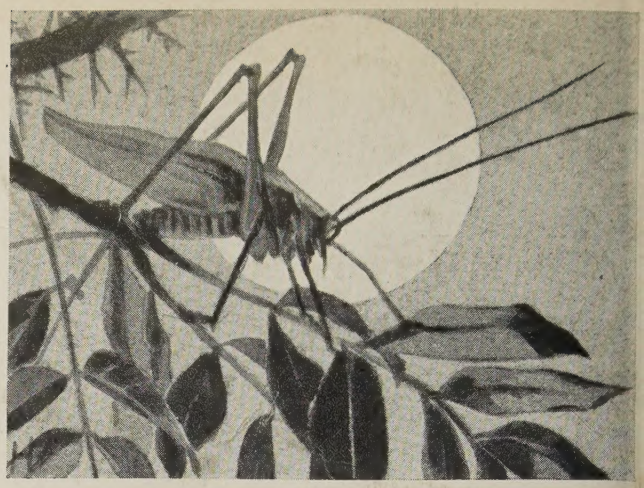

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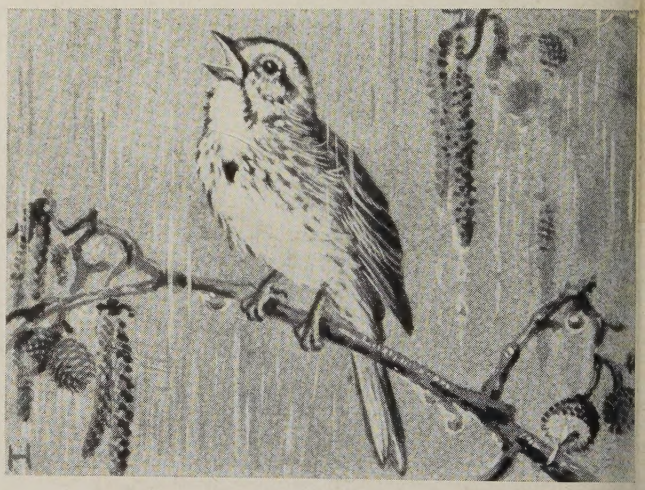

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